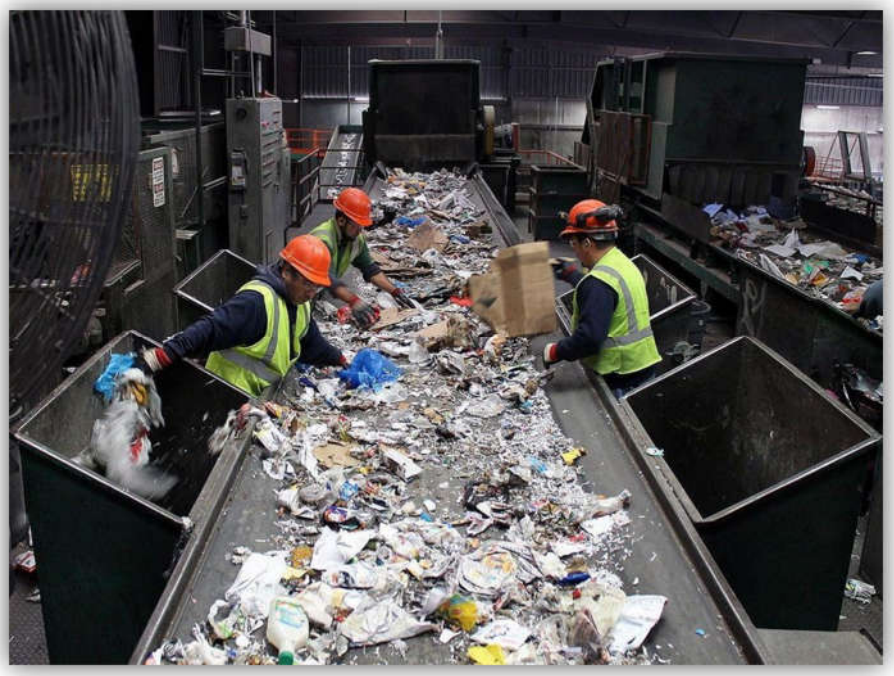
Little Island Waste Recycling and Transfer Station

Courtstown Industrial Park, Little Island, Co. Cork



Proposed Development of a Recycling and Transfer Station at Courtstown Industrial Park, Little Island, Co Cork.

Environmental Impact Assessment

Volume I: Environmental Impact Assessment Report (EIAR)

November 2018

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Little Island Recycling and Transfer Station

Courtstown Industrial Park, Little Island, Co. Cork

Volume I: Environmental Impact Assessment Report (EIAR)

Contents

1 Chapter One - Introduction

1.1 Introduction

Country Clean Recycling Unlimited Company (CCR) proposes to submit a planning application for the development of a warehouse facility operating as a waste recycling and transfer facility at Courtstown Industrial Park, Little Island, Co. Cork, the location of which is shown on **Figure 1.1 Site Location** provided in **EIAR Volume III: Drawings and Figures**

OES Consulting has been commissioned to prepare an Environmental Impact Assessment Report (EIAR) and Appropriate Assessment Screening Report for the proposed development which includes the following:

- *Provision of a new warehouse facility to provide a waste transfer and recycling plant and office area with a waste throughput of 95,000 tonnes per annum.*
- *Provision of appropriate receiving areas for receiving mixed non-hazardous waste materials.*
- *Development of a two-storey site office building.*
- *ESB MV sub Station Building.*

The proposed facility will accept waste types in accordance with relevant Waste Disposal Activities specified under the Third Schedule of the Waste Management Act 1996 as amended (D11, D12 and D13) and will recover materials in accordance with the recovery operations specified under the Fourth Schedule of that Act (R3, R4, R5, R11 & R13).

The proposed development will not accept or handle hazardous waste of any nature and proposes separation, sorting and recycling facilities only with no further treatment or chemical treatment processes proposed at the site such as incineration, pyrolysis or gasification.

1.2 Background

A planning application (reference number 07/10229) for the "Construction of a waste transfer and recycling station, office, truck garage, ESB sub station, buried diesel tank and associated site works including wheel wash and weighbridge" at the site of the development for which this EIAR has been undertaken at Little Island was granted permission by Cork County Council on 11th January 2008, providing confirmation that the proposed use of the site for waste transfer and recycling is acceptable to the Council. An EIA was not required by the Council as part of the planning application. An extension to the duration of this planning permission was awarded by Cork County Council under planning reference 12/5221.

More recently, in 2017 the site was the subject of an application for the construction of a waste transfer and recycling facility (Planning Reg 17/7428, submitted 22/12/2017). This appoilcation wahich was withdrawn, was to "Construct a building (6625sq.m) containing a waste transfer and recycling facility. The proposed development also includes the construction of a separate two storey administration block (178 sq.m). ESB Sub-station (36sq.m), 3 no. weighbridges, 2 no. access ramps, new exit gate and signage to eastern site boundary, new boundary treatments, supplementary planting inside western site boundary, underground firewater containment tank, underground diesel storage tank, service yard, 23 no. car parking spaces, bring site open to the public, new drainage works including 3 no. oil interceptors and 1 no. silt trap along with all associated site works all on a site measuring 1.49ha"

The current application draws significantly on the 2017 application, and proposes a largely similar proposal for the site, with the exclusion of the Bring Site, which was removed from the application during consultation with the public, on the application and EIAR, on the grounds of traffic.

Where consultation with statutory bodies was undertaken by the Planning Department on the 2107 application, the current application takes account of the content of those responses to consultation where relevant throughout the EIAR.

1.3 The Developer

Country Clean Recycling Unlimited Company (CCR) is a Local Cork company headquartered at Ballywalter, Shanballymore, Mallow, Co. Cork. The company directly employs over 205 people and provides for another 100 indirect jobs.

The company is a family run business owned by Mr. David and Mary O' Regan, who have been active in the waste management industry since 1990 on establishment of waste collection service for their local area of Shanballymore, near Mallow with two employees.

In June 2003 CCR brought into the waste skip market and began operating a waste transfer station in Churchfield (50 Employees). In September 2010 Country Clean Recycling was chosen by Cork County Council to take over its Waste Collection Service operations of its 36,000 customers (120 Employees).

In October 2011 Country Clean Recycling took over Cork City Council Waste Collection Service of 25,000 customers (180 Employees). In 2015 Country Clean Recycling completed its upgrade works (including the installation of an air treatment unit) of its recently EPA licensed waste transfer station in Churchfield Cork (205 Employees).

Country Clean Recycling is now one of the largest waste collection operators in Cork, servicing over 90,000 residential, commercial and industrial clients.

This planned Material Recovery Facility (MRF) will employee 25 more staff members, bring the total staff numbers within the organisation to 230.

The purpose of the facility is to process Municipal Solid Waste (MSW) for treatment by separating the recyclable fractions of the waste before being sent for recovery or disposal. Such operations are in line with government policy documents of waste as a Resource Opportunity. (2012 waste policy document *A Resource Opportunity*. *Waste* Management Policy in Ireland. Department of the Environment).

The Cork City area has a rapidly growing population – under Project Ireland 2040 and the National Development Plan, the population of Cork is expected to grow from its current level of about 120,000 people to between 320,000 and 360,000 by 2040 through a range of measures including extension of the City boundary and strategic direction of population into the area.

CCR, with its considerable experience, believes that the waste management facility proposed for the Little Island site, will contribute significantly to meeting the City's waste management objectives in the context of this growing population.

1.4 Site and Surrounding Lands Description

The proposed waste transfer & recycling facility is situated near the south-east coastline of Little Island, in the townland of Courtstown. The site is located within the Courtstown Industrial Park (national grid reference: 177044E, 071656N) as shown on **Figure 1.1 (EIAR Volume III)**. The proposed green-field site is located within an established commercial industrial estate and is bounded by lands formerly used as the Harbour Point Golf Club to the west, an agricultural field to the north and number of commercial properties to the east and south.

The nearest residential properties are located 320m to the east and 370m to the north east on Harbour Point Business Park Road and Ballytrasna Park Road respectively as shown on **Figure 1.3, provided in EIAR Volume III**. The eastern boundary of the proposed site is lined by the industrial properties lining Courtstown Park Road whilst the nearest residential properties to the south are those on Clash Road, 450m from the southern boundary of the site. The nearest residential properties to the west are those lining Clash Road, on the western boundary of the now disused Harbour Point Golf Club, 550m to the west.

The topography of Courtstown Industrial Park is described as relatively low-lying at an elevation of between 10m – 20m AOD with the topographic gradient rising to 30m AOD along the western boundary of the site, see **Drawing 1000 – Existing Site Layout (EIAR Volume III)**.

The proposed development site is a green field site, the eastern boundary of which abuts existing business/warehousing premises and contains some vegetation including oak, goat willow, gorse and bramble. The western boundary is defined by dense vegetation cover including hawthorn and elder. Dense vegetation on the other side of the western boundary includes poplar, pine, alder and Monterey cypress. The southern boundary of the site is undefined in the field which the site forms part of. The field is currently unmanaged and consists of grass sward which has become heavily infested with weeds.

The northern boundary is defined by a hawthorn hedge and two ash trees. Lands to north of the site are currently in agricultural use (grassland) and are zoned under the Local Area Plan 2017 Special Policy Area LI – X - 02 (Medium B density residential development up to a maximum of 250 dwelling units incorporating a landscape buffer between the residential units and other site uses).

Within the zoned area, approximately 150m to the north, an application for planning permission for a residential development was lodged on August 01, 2018 Planning Ref: 18/6021. The application site is not contiguous and its boundary is some 150m from the Country Clean Recycling lands.

The planning application, which was submitted to Cork County Council on August 1, 2018 relates to housing development as follows:

A residential development comprising the construction of 75 no. dwelling houses, a creche and all associated ancillary site development works including access, parking, footpaths, drainage, landscaping and amenity areas. The development includes the creation of a new vehicular access road along the sites eastern boundary via Ballytrasna Park to service the site. The ancillary site development works consist of the diversion and undergrounding of the existing MV (10KV/20KV) ESB electrical cables.

This application is currently (November 8, 2018) the subject of a substantial request for Further Information (RFI), issued by Cork County Council Planning Department on September 24, 2018. Of

particular relevance to the current application for a waste recycling and transfer facility by CCR are the following requests:

Point 1 of the RFI requests consideration be given to reducing overall housing numbers on the site;
Point 2 requests a redesign around the proposed layout to remove housing further from the zoned industrial lands;
Point 3 requests a redesign in terms of the mix of housing type.

Based on the above three points, it is considered that a substantial redesign of the proposed housing scheme is required, both in terms of the numbers and type of dwellings, their position on the site and distance form boundaries.

Although, therefore it is not possible to assess in detail the potential interactions between the proposed CCR waste facility and the housing development, observations and comments have been made where relevant as to the likely interaction between the two applications.

Planning designations on the site of the proposed development are discussed further in Chapter 3.

The proposed facility is located within the catchment of the River Lee, which rises in the west Cork mountain ranges approximately 60km to the west of Cork City and is located approximately 400m to the west of the Cork Harbour Special Protection Area (SPA) and the Great Island Channel Special Area of Conservation (SAC) and proposed Natural Heritage Area (pNHA). A separate Appropriate Assessment Screening report provided as **Appendix 5.2** (**EIAR Volume II**) has assessed the potential impacts of the project on ecologically designated sites such as those mentioned above.

1.5 Planning and Consents History

A summary of the planning permissions sought and granted at the Little Island site are provided in Table 1.3 below.

Table 1.3: Planning Permissions at the site of the Proposed Development

Planning Reference	Application Date	Grant Date	Development Description
07/10229	10/08/2007	11/01/2008	Construction of waste transfer and recycling station, office, truck garage, ESB sub station, buried diesel storage tank and associated site works including wheel wash and weighbridge.
08/5549	19/03/2008	Application withdrawn	Construction of biomass fuelled combined heat and power (CHP) plant comprising of prime mover, electric generator, heat recovery system, fuel reception/storage area and associated 30m high exhaust stack and associated ancillary works.
08/5961	09/04/2008	Application withdrawn	Combined heat and power plan (CHP) with 30m high exhaust stack. The plant will consist of prime mover, electric generator, heat recovery system and fuel reception/storage area.
12/5221	01/06/2012	04/09/2012	Extension of Duration of Planning Permission awarded to application 07/10229 for the Construction of waste transfer and recycling station, office, truck garage, ESB sub station, buried diesel storage tank and associated site works including wheel wash and weighbridge.

Planning Reference	Application Date	Grant Date	Development Description
17/7428	22/12/2017	Application withdrawn	Construct a building (6625sq.m) containing a waste transfer and recycling facility. The proposed development also includes the construction of a separate two storey administration block (178 sq.m). ESB Sub-station (36sq.m), 3 no. weighbridges, 2 no. access ramps, new exit gate and signage to eastern site boundary, new boundary treatments, supplementary planting inside western site boundary, underground firewater containment tank, underground diesel storage tank, service yard, 23 no. car parking spaces, bring site open to the public, new drainage works including 3 no. oil interceptors and 1 no. silt trap along with all associated site works all on a site measuring 1.49ha

1.6 Regulatory Requirement for an EIAR

The proposed development is a sorting and transfer facility only, with no disposal of waste proposed at the site or in the surrounding lands.

However, Schedule 5 of the Planning and Development Regulations 2001 – 2018 does not contain a specific EIA threshold level for waste sorting and transfer stations so in order to assess whether EIA is required, the category most similar to the proposed development within the regulations relating to waste disposal, has been used in this instance as it contains a threshold of waste acceptance (in tonnes) which can be viewed as relevant to the proposed development.

Schedule 5 of the Planning and Development Regulations 2001 - 2018 lists the categories of development requiring an EIAR to be undertaken. The category of development within the EIA Regulations viewed as most similar to the proposed development is listed in Part 2, Section 11 (b), which states that an EIAR is required for:

"Installations for the disposal of waste with an annual intake greater than 25,000 tonnes not included in Part 1 of this Schedule."

As the proposed development will have an annual intake of 95,000 tonnes of waste, it is determined against this category of development that an EIAR is required.

The EIAR will be prepared in accordance with statutory requirements of the Planning & Development Acts 2001 - 2018 and associated Regulations 2001-2018 and the European Communities (Environmental Impact Assessment) Regulations, specifically the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018) and associated amending regulations where relevant.

Accordingly, the EIAR will broadly contain the following:

- A Non-Technical Summary;
- A Project Description;
- A description of the receiving environment for a number of environmental topics. This will be focused on identifying the current baseline conditions.
- An assessment of actual impacts and potential impacts liable to occur as a result of the proposed development. Direct, indirect and cumulative impacts of mixed waste processing

operations and transfer from the proposed facility will be assessed for each environmental topic.
- A detailed assessment of alternatives assessed against environmental impacts.
- Details of mitigation factors and/or measures undertaken or proposed will be identified.

The EIAR will provide a description of the receiving baseline environment in which the facility is located. Available environmental data on the interactions between the different environmental impacts on receptors such as groundwater, surface water, noise and air quality will be used as part of the assessment. Historical information available on cultural heritage will be used as part of the assessment to establish the impact of the existing development on cultural heritage. The impact on traffic and road infrastructure and visual landscape will also be addressed.

1.7 Consultation and Scoping for the EIAR

Consultation is a practice that is carried out to ensure that all relevant issues are addressed in the EIAR. The consultation process for the current facility involved the distribution of a formal Scoping Consultation Document to a number of consultees asking them for a written opinion on the proposed content of the EIAR. The following bodies were consulted on 28th June 2017:

- *Cork County Council;*
- *Inland Fisheries Ireland;*
- *The Heritage Council;*
- *Transport Infrastructure Ireland;*
- *Geological Survey of Ireland;*
- *An Taisce;*
- *Development Applications Unit – Department of Arts, Heritage and the Gaeltacht;*
- *Environmental Protection Agency;*
- *Office of Public Works; and*
- *National Parks and Wildlife Service.*
- *Irish Water*

Scoping responses received from bodies who provided feedback are provided in **Appendix 1.1** of **EIAR Volume II: Appendices.**

A pre-submission meeting with members of the Cork County Council planning department took place on September 15, 2017 and June 26, 2018 and to discuss the scope of the EIAR and explain both the categories of development requiring an EIAR which the proposed development was assessed against.

Public Consultation

Country Clean Recycling (CCR) organised a public information evening which was held between 5pm and 8pm on October 30, 2018 at Radisson Blu Hotel, Castleview, Little Island. The purpose of the public information session was to provide details about our plans to local residents and other key stakeholders and included a series of information boards and leaflets explaining the proposed development. Representatives from CCR and senior members of the planning and environmental team working on the project were on hand to answer questions.

Residents in the vicinity of the proposal were informed of the information evening by way of mail drop and approximately 50 letters were delivered to the closest residential properties to the site. In addition, telephone contact was made with representatives of the local business association to invite them to the evening.

Approximately 13 members of the public attended the information evening and feedback from the evening indicated that the primary concerns relating to the proposed development (and indeed any development) related generally to current levels of traffic congestion on Little Island.

A number of queries regarding the waste handling process, odour control hours of operation and types of waste were addressed on the night and elaborated on within the EIAR. A specific query regarding daily and hourly traffic numbers arising from the proposal was responded to directly via email and more detailed information on traffic is contained within the EIAR.

Arising from the public information session and taking account of the concerns expressed by attendees to the information evening around traffic generation, CCR have decided to omit proposals for a public civic amenity component to the proposal.

It was felt on assessment by the Project Team and consideration by CCR, that the Civic Amenity component would give rise to unpredictable traffic generation from members of the public assessing the facility, and that these traffic movements would be difficult for site management to control.

Therefore, arising from the potential to give rise to additional and unpredictable traffic volumes at peak periods, which may have the potential to add to existing levels of congestion in the area, CCR have decided not to include a civic amenity component to the proposal.

2 Chapter Two – The Environmental Impact Assessment Report

2.1 The Environmental Impact Assessment Report (EIAR)

The EIAR has been prepared in line with requirements of European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018). This section outlines the primary sections of this document.

2.2 General Guidance

This EIAR has been prepared in accordance with requirements of the *Planning and Development Act 2000 and the Planning and Development Regulations 2001 – 2018 and* EU (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296 of 2018).

The EIAR has also been prepared in accordance with the following EPA documents and relevant best practice guidelines:

- "Guidelines on the information to be contained in Environmental Impact Assessment Reports" (draft, May 2017).
- "Advice notes on current practice in the preparation of Environmental Impact Statements" (draft, September 2015);
- "Guidelines for Planning Authorities and An Bord Pleanala Carrying out Environmental Impact Assessment" Department of the Environment, Community and Local Government (2018).

Where a specialist chapter incorporates additional best practice or guidance documents these are outlined within the relevant section's methodology.

2.3 Structure of the EIAR

This EIAR is accompanied by an Appropriate Assessment screening report, Planning Application and a Non-Technical Summary (NTS) of the EIAR. These documents are separate from this EIAR but form part of the overall development application. The structure of this EIAR adopts a sequence as follows:

- General Description of the EIAR and how it relates to the development;
- Description of the Development, Need and Planning Context;
- Alternatives Considered based on environmental impacts;
- Impacts – incorporating baseline data and specialist findings;
- Interactions.

In the description of the impacts of the activity the following attributes of the receiving environment and their interactions are described which reflect the amendments being introduced through the transposition of EIA Directive 2014/52/EU:

- Biodiversity;
- Land (Soils, Geology and Hydrogeology and Land Use)
- Water (Hydrology,)
- Noise and Vibration;
- Air Quality, Odour and Climate;
- Cultural Heritage;
- Traffic and Transport;

- Population and Human Health;
- Landscape and Visual;
- Material Assets;
- Traffic and Transport;
- Consideration of Alternatives, and
- Interactions

The EIAR is provided in the following format:

- Volume I: EIAR Main Text
- Volume II: EIAR Appendices
- Volume III: EIAR Drawings and Figures
- Volume IV: Non-Technical Summary

2.3.1 Content of the EIAR

The content of the information to be included in the EIAR and the technical assessments required for different categories and classes of development are provided within the project list in the draft 2015 EPA document "Advice notes on current practice in the preparation of Environmental Impact Statements". 33 different project types are listed, however a waste sorting, recycling and transfer station is not specifically listed as a project type.

Waste projects referenced in the list relate to the following types of development without specific categorisation for a waste sorting, recycling and transfer station

- Project Type 31: Installations for the Disposal of Waste; Sludge Deposition sites
- Project Type 32: Waste Disposal installations for the incineration, chemical treatment or landfill of hazardous and non-hazardous waste.

The proposed development is a recycling, sorting and transfer station only and does not include proposals or facilities for acceptance, treatment or disposal of hazardous waste, disposal of any waste type including sludge, incineration or chemical treatment of waste in any way.

As a result, the waste project types describe information to be included within the EIAR and potential environmental effects which are not relevant to the proposed development. However, the information requirements and environmental effects to be assessed listed in the advice notes for Project 31 are most relevant out of the project type list to the proposed development. The completion of the EIAR in line with the information requirements for a Project Type 31 development was requested by the EPA in their scoping response letter dated 26th October 2017.

Therefore, this EIAR has been informed by the Project Type 31 information requirements where relevant and is informed by the technical assessments discussed above in Section 2.3.

2.4 Methodology

2.4.1 Assessment of the Effects – Evaluation Criteria

The assessment of effects has been undertaken in accordance with best practice, legislation and guidance notes. The significance criteria as set out in the EPA Guidelines (2015 and 2017 (Draft)) and listed in Table 2.1 below have been followed throughout this EIAR unless otherwise stated in the methodology for each chapter and/or specialist reports.

Table 2.1: EIAR Assessment Criteria

Significance Level	Criteria
Profound	An impact which obliterates sensitive characteristics
Significant	An impact, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Moderate	An impact that alters the character of the environment in a manner that is consistent with existing and emerging trends.
Slight	An impact, which causes noticeable changes in the character of the environment without affecting its sensitivities.
Imperceptible	An impact capable of measurement but without noticeable consequences.

As per the EPA Guidelines, impacts are considered as being negative, neutral or positive in nature. Impacts are also considered as being direct, indirect and/or cumulative, as appropriate. Duration of impact is considered as being:

- Temporary (up to one year);
- Short-term (from 1 to 7 years);
- Medium-term (7 to 15 years);
- Long-term (from 15 to 60 years); or
- Permanent (in excess of 60 years).

2.5 Project Team

This EIAR has been prepared by an OES EIA Project Manager assisted by a team of qualified and experienced environmental specialists outlined in Table 2.2 below with detailed descriptions of competent expertise provided at the beginning of each technical chapter:

Table 2.2: Environmental Consultants

Technical Area	Consultant
Biodiversity	Wetland Surveys Ireland
Water	OES Consulting
Land and Soils	OES Consulting
Noise and Vibration	Redkite Environmental
Air Quality, Odour and Climate	Odour Monitoring Ireland
Cultural Heritage	Dr Maurice Hurley
Traffic and Transport	NRB Consulting
Material Assets	OES Consulting
Population and Human Health	OES Consulting
Consideration of Alternatives	OES Consulting

2.6 Guide to the Document

The document has been structured to facilitate a clear presentation of the proposed development, the potential impacts on the environment and the measures to mitigate these. Accordingly, the remainder of the document is set out as follows:

Chapter Three – Planning and Waste Policy Context

Chapter 3 provides a discussion on the planning policy context of the proposed development including a description of the regional and local policies relevant to the proposed site and the surrounding land uses and designated sites. National and regional waste policy is also described with a discussion provided on how the proposed development is seeking to aid meet national and regional objectives of reducing waste streams and implementing the waste hierarchy.

Chapter Four – Description of the Proposed Development

Chapter 4 describes the existing environment at the proposed Little Island site and provides detailed information on the proposed developments being put forward as part of the planning application to Cork County Council. An overview of the proposed waste sorting and separation activities at the proposed facility is provided with descriptions of both inputs and outputs involved in this process.

Chapters 5 to 16 – Impact Assessments

Chapters 5 to 16 comprise a number of detailed technical assessments of the proposed development to ensure all potential impacts of the proposed development on the environment are addressed, including:

- Biodiversity - (Chapter 5);
- Land (Soils, Geology and Hydrogeology and Land Use) - (Chapter 6);
- Water (Hydrology) (Chapter 7)
- Noise and Vibration (Chapter 8);
- Air Quality, Odour and Climate (Chapter 9);
- Cultural Heritage (Chapter 10);
- Population and Human Health (Chapter 11);
- Landscape and Visual (Chapter 12);
- Material Assets (Chapter 13);
- Traffic and Transport (Chapter 14), and
- Consideration of Alternatives (Chapter 15).

Chapter Sixteen – Interactions

Chapter 16 assesses the interactions between the aspects of the environment likely to be significantly affected by the proposed development.

3 Chapter Three: Planning and Waste Policy Context.

3.1 Introduction

This chapter provides a description of the county and local planning policies relevant to the proposed Little Island site location and discusses the aims of Cork County Council for the ongoing development of Little Island. National planning and waste policies and objectives are also discussed in this chapter, which is followed by an explanation of the compliance of the proposed development with these.

3.2 Proposed Development

The proposed waste sorting plant comprises the construction of a waste transfer warehouse and recycling station, a two-storey office building, ESB sub-station and associated site works including two weighbridges, ramps and associated parking bays and will be located on a green field site within the Courtstown Industrial Park (in the townland of Courtstown) to the east of Little Island as shown on **EIAR Figure 1.1, 1.2** and **1.3 (EIAR Volume III)**.

The footprint of the proposed warehouse development, excluding the external elements such as the weighbridges, ramps and associated parking bays will be approximately 6,757m^2 (0.67 ha), as shown on **Drawing 1017 provided in EIAR Volume III.** It is proposed that the new warehouse facility will have a maximum height of approximately 12.8 m, a reduction on the 14.5m height of the permitted waste facility on the site proposed through planning application 07/10229.

The heights and elevations of the proposed waste transfer station warehouse are shown on **EIAR Drawings 1011, 1012 and 1013, EIAR Volume III.**

The key elements of the proposed development are as follows:

- Provision of a new warehouse facility to provide a waste transfer and recycling plant and office area;
- Provision of appropriate receiving areas for receiving mixed non-hazardous waste materials;
- Process wastewater drainage at the site will connect into the existing public foul drainage network located at the entrance of the development as shown on **Drawing 1007, provided in EIAR Volume III.**

All waste water will be directed to the municipal waste water treatment plant at Carrigrennan, Little Island, via the existing pipeline network. Discharges to surface waters will not take place at the facility with all waste water going straight to the local sewer network. Irish Water have confirmed that they have no objection to the proposed connection to the public water and wastewater infrastructure, subject to the normal connection agreements.

3.3 Site Planning Policy Context and Planning Status

3.3.1 Regional Planning Policy

Regional Planning Guidelines for the Southwest Region 2010-2022

The Regional Planning Guidelines (RPGs) formulate public policy for the south west region, integrating land-use, transport, economic growth and investment, to enable the region to continue to grow as a sustainable high-quality location for investment and one in which to live, work and visit.

The regional planning guidelines for the southwest region cover the period of 2010 to 2022. Within this region, the document notes that 'progress is required on the development of a materials recovery facility to service Cork City and wider Cork Gateway'.

Regarding the requirement for integrated waste management industries, the guidelines state (section 5.6.17) that "*An important issue relating to waste management is the need for a Materials Recovery Facility (MRF) or Mechanical Biological Treatment (MBT) to be developed, at an early date, in a sustainable location within the Cork Gateway, with good transportation links*".

The proposed development seeks to address the current lack of material waste recovery facilities in County Cork as identified in section 1.3.29 "*Progress is required on the development of a materials recovery facility to service Cork City and County. While there are material waste recovery facilities in County Kerry, the development of additional such facilities at sustainable locations is desirable*".

The proposed development seeks to meet the aims of the Regional Planning guidelines in relation to the development of Materials Recovery Facilities within County Cork.

3.3.2 County Planning Policy

Cork County Development Plan 2014

The 2014 Cork County Development Plan (CCDP) identifies Little Island as a Strategic Employment Area. The specific objective in the CDP for Strategic Employment Areas is to promote the development of these areas which are considered suitable for large scale developments. It is an objective to protect lands in these areas from inappropriate development which may undermine their suitability as Strategic Employment Centres.

The CCDP designates the development site within the metropolitan green belt surrounding Cork City and within an Area of High Landscape Value. County Development Plan Objective GI 6-1: Landscape seeks to:

- Protect the visual and scenic amenities of County Cork's built and natural environment.
- Ensure that landscape issues will be an important factor in all land use proposals, ensuring that a pro¬active view of development is undertaken while maintaining respect for the environment and heritage generally in line with the principle of sustainability.
- Ensure that new development meets high standards of siting and design.
- Protect skylines and ridgelines from development, and
- Discourage proposals necessitating the removal of extensive amounts of trees, hedgerows and historic walls or other distinctive boundary treatments.

The proposed development site is located within the Landscape Character Type "City Harbour and Estuary" of Type 1 as listed within the Cork County Draft Landscape strategy published in 2007. The strategy (pg. 15) states that proposals for medium and large scale business, retail and industrial uses within this landscape area type, which may impact on the character of the harbour area, must consider the landscape implications at the outset and so a landscape scheme should be submitted with planning applications. A detailed landscape and visual assessment is provided within **Chapter 12 below**.

The assessment determined that the proposed development will not incur any significant impacts in respect of local landscape character or sensitive visual receptors in the environs of the site, i.e. local or distant residents or users of the surrounding road network infrastructure. The assessment stated the absence of adverse impacts reflects the manner in which the proposed development will be

integrated among similar developments on the business park and the mitigating effect of distance in views from residential areas and the road network around the harbour.

The proposed development site is also located within the designated County Metropolitan Cork Strategic Planning Area. Objective CS 4-1 of the County Plan recognises "The importance of the role to be played by Metropolitan Cork in the development of the Cork 'Gateway' as a key part of the Atlantic Gateways Initiative and, in tandem with the development of Cork City, to promote its development as an integrated planning unit to function as a single market area for homes and jobs", whilst also seeking to "Maintain the principles of the Metropolitan Cork Greenbelt to protect the setting of the City".

Section 11.7.4 of the CCDP states that the provision of strategic large scale waste treatment facilities will be considered in 'Industrial Areas' designated as Strategic Employment Areas similar to the Little Island site.

Cobh Municipal District Local Area Plan

This Local Area Plan for the Cobh Municipal District was adopted on 24th July, 2017, and came into effect on 21st August, 2017, replacing the previous Blarney Electoral Area Plan. It sets out the detailed planning strategy and land use zoning as appropriate for the towns and villages of the Municipal District, with the exception of that part of Cobh Town, formerly administered by Cobh Town Council, where the Cobh Town Development Plan 2013 remains in force.

Within Little Island, the continued future use of the proposed development site for industrial purposes has been proposed within the recently adopted Plan which designates the development site within a larger 7.01 ha zoned area under Site Objective **LI-I-02**:

"*Industrial Estate and/ or warehousing and distribution with provision for local access road. Minimum 20 – meter wide tree planted buffer along northern and western boundary of site. 20- meter wide*".

Under the LAP 2017, lands to the east of the site, formerly used as a gold course, are zoned **LI - X-01** Special Policy Area - *Mixed use development, including primarily business uses but also a hotel and significant open space, link road*. To the north, lands formerly included with in the industrial zoning, are now designated **LI-X-02** - *Medium B density residential development up to a maximum of 250 dwelling units incorporating a landscape buffer between the residential units and other site uses*.

It is noted that both the industrial zoning - LI-I-02 and nearby medium density residential zoning LI-X-02 incorporate requirements for a landscaped buffer, which has the effect of reinforcing screening of residential developments form the industrially zoned lands, thereby protecting the residential amenity, without compromising on the ability of the industrially zoned lands to be developed.

The Plan continues to state that *"Current Local Area Plan policy for the area is to reaffirm Little Island's function as a strategic centre of general business development while protecting the amenity enjoyed by existing residential communities (pg 151).*

Compliance with Planning Policy

The proposed development complies with the aims of both regional and local planning guidelines and development plans as it seeks to install and manage a Materials Recovery Facility (MRF) which will address the identified need to develop such a facility to service Cork City and the wider Cork Gateway as stated in section 5.6.17 of the Regional Planning Guidelines.

The development of a materials recovery facility in an industrial site within Little Island supports section 11.7.4 of the Cork County Development Plan which states that the provision of strategic large-scale waste treatment facilities will be considered in 'Industrial Areas' designated as Strategic Employment Areas, the designation assigned to Little Island. The proposed development is essentially an industrial warehouse structure housing waste sorting and recycling activities which aligns with the proposed land use for the site outlined in the Cobh Municipal District Local Area Plans.

The proposed development will strengthen the contribution of the materials re-use and recovery to the national and regional objectives of increasing recycling and reducing levels of waste disposal.

3.4 Waste Policy Context

The need for the proposed waste recycling and transfer facility is clear in terms of a number of factors. The current national policy on waste management sets out the measures through which Ireland intends to become a recycling society, with a clear focus on resource efficiency and the virtual elimination of land filling of municipal waste. The delivery of the policy is progressed through mandatory regional waste management plans.

3.4.1 National Waste Policy

A Resource Opportunity Waste Policy in Ireland

This policy document was published by the then Department of Environment, Community and Local Government in July 2012 and sets out the measures through which Ireland will make the further progress necessary to become a recycling society, with a clear focus on resource efficiency and the virtual elimination of landfilling of municipal waste.

The Policy document acknowledges that strides must be taken to reduce the country's dependence on landfill whilst also maximising the capabilities of separation, recycling and reuse facilities:

"*Notwithstanding the progress made over the last 15 years, Ireland still has an unsustainable dependence on landfill as a method of managing its waste. The need for much more rapid progress in the provision of sustainable alternatives was indicated in the national Waste report for 2010. While the most pressing immediate driver must remain compliance with the landfill Directive limits, we must also now plan more fundamentally for alternative approaches that will allow us effectively to eliminate our use of landfill within the next decade"*. (page 45)

The policy emphasises the need to generate a more developed indigenous recycling sector that not only reduces our reliance on volatile world markets, but also benefits the domestic economy in terms of securing greater value added and job creation in Ireland.

3.4.2 Regional Waste Policy

Southern Region Waste Management Plan 2015 - 2021

The Waste Management Plan for the Southern Region is the framework for the prevention and management of wastes in a safe and sustainable manner. The waste management plan is a statutory document prepared by the local authorities of the region, covering a period from 2015 to 2021. Three strategic targets have been set in the plan, relating to the areas of prevention, recycling and landfilling, with long term goals set down including reaching a recycling rate of over 60%.

The plan estimates that public authority expenditure of over €60 million will be required each year of the plan period, whilst up to €300 million of potential investment by the private sector in new waste treatment infrastructure has been identified for the region. Improving our waste infrastructure is a clear policy ambition of the waste plan. The policy aim is for the region and the State to become more self-sufficient, in terms of treating the wastes we generate and are currently exporting.

Some of the key measures for local authorities and industry contained in the plan can be summarised as follows:

- Commit to a minimum expenditure on waste prevention activities each year;
- Encourage more reuse and repair activities in the region, particularly at civic amenity facilities; and
- Plan and develop higher quality waste treatment infrastructure including new reprocessing, biological treatment, thermal recovery and pre-treatment facilities.

The plan states that the role of the authorities in waste management changed significantly in the region during the previous plan period. Historically the authorities were involved in the delivery of waste collection and treatment infrastructure. This is no longer the case, and at present in the region only two authorities remain in waste collection and one local authority landfill remains open. The provision of collection and treatment services over the plan period will primarily rest with the private sector.

3.4.3 Compliance with Waste Policy

The proposed development supports national waste policy objectives and Policy A1 of the Southern Region Waste Management Plan which seeks to apply the waste hierarchy to the management of waste streams and increase recycling levels and the quality of recyclable materials within the southern region.

The proposed pre-treatment facility will act as the first destination for wastes, extracting and generating high quality outputs for onward treatment, which is in line with Policy E2 of the Southern Region Waste Management Plan.

The proposed development further helps to achieve the targets set out in the Southern Region Waste Management Plan, to achieve a 50 % recycling rate of managed municipal waste by 2020. This facility will be able to remove the recyclable fraction from mixed municipal waste to send it for recycling.

4 Chapter Four Description of the Proposed Development

4.1 Introduction

This chapter provides detailed information on the proposed Little Island development being put forward as part of the planning application to Cork County Council. An overview and description of the proposed processing activities at the facility is provided along with descriptions of both inputs and outputs involved in this process.

4.2 The Proposed Development

The proposed development includes the following:

- Provision of a new warehouse facility to provide a waste transfer and recycling plant and office area
- Provision of appropriate receiving areas for receiving mixed non-hazardous waste materials.
- The proposed facility will accept materials in accordance with the following Operations of the Fourth Schedule of the Waste Management Act (1996)
- Development of a two-storey site office building.
- ESB MV sub Station Building.

The proposed development will not accept or handle hazardous waste of any nature and proposes separation, sorting and recycling facilities only with no further treatment or chemical treatment processes proposed at the site such as incineration, pyrolysis or gasification.

4.2.1 Waste Transfer and Segregation Warehouse

The proposed warehouse facility will be the primary element of the proposed development and will take up the majority of the site. The facility will be 12.8 m high and will be spread over a total of 6,757m^2 as shown on **Drawing 1017**, provided in **EIAR Volume III**. Building elevations will be reinforced concrete block built with insulated metal cladding on the top half of each elevation up to roof level which will be grey in colour. The roof will consist of two apex roofs spanning over 47m and 38m in area respectively as shown on **Drawing 1013,** with ridge heights of 12.8m and 12.43m respectively as shown on **Drawings 1004, 1011 and 1012** provided in **EIAR Volume III**.

4.2.2 Site Office

The operational site offices will be located in the north eastern corner of the site and will provide offices, a staff canteen, locker rooms, toilets and a tea station over two floors as shown on **Drawing 1015.** The office building will be 8.5m high from ground level to roof tip point and will have a smooth plaster painted render finish. The roof will consist of Kingspan KS1000RW Wall and Roof cladding. The office building will offer two floors each covering an area of 107m^2.

4.2.3 ESB Sub Station

A 3m high ESB sub station and switch room is proposed in the south eastern corner of the development site, adjacent to the site entrance onto Harbourpoint Business Park road, as shown on **Drawings 1001** and **1005**. The external facades will have a rendered blockwork finish with steel doors and an asphalt roof.

4.3 Activity Description

Country Clean Recycling (CCR) will apply for consent to operate the facility from the Local Authority (Waste Permit) or EPA (Waste Licence) as appropriate. The proposed facility is essentially a new warehouse functioning as a waste processing plant. It will include the acceptance of source separation waste (e.g. brown bin waste, glass packaging, cardboard and co-mingled packaging waste) along with residual municipal waste and skip waste from household and commercial sources. The facility will allow for the diversion of these waste types to non-disposal waste management routes, by means of manual sorting, mechanical treatment, crushing, grading, magnetic separation, sorting and baling.

The proposed facility will operate in accordance with Waste Disposal Activities D11, D12 and D13 of the Third Schedule of the Waste Management Act 1996 as amended which are defined as follows:

- *D13 Blending or mixing prior to submission to any of the operations numbered from D1 to 12 (if there is no other D code appropriate, this can include preliminary operations prior to disposal including pre-processing such as, amongst others, sorting, crushing, compacting, pelletising, drying, shredding, conditioning or separating prior to submission to any of the operations numbered D1 to D12);*
- *D14 Repackaging prior to submission to any of the operations numbered D 1 to D 13, and*
- *D15 Storage pending any of the operations numbered D 1 to D 14 (excluding temporary storage (being preliminary storage according to the definition of 'collection' in section 5(1)), pending collection, on the site where the waste is produced).*

The proposed facility will recover materials in accordance with Operations R3, R4, R5, R11 & R13 of the Fourth Schedule of the Waste Management Act 1996 as amended. These aforementioned activities relate to the waste blending, repackaging, and storage activities, defined as follows:

- *R3 Recycling/reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes), which includes gasification and pyrolysis using the components as chemicals;*
- *R4 Recycling/reclamation of metals and metal compounds;*
- *R5 Recycling/reclamation of other inorganic materials, which includes soil cleaning resulting in recovery of the soil and recycling of inorganic construction materials;*
- *R11 Use of waste obtained from any of the operations numbered R 1 to R 10;*
- R12 Exchange of waste for submission to any of the operations numbered R1 to R11, and
- *R13 Storage of waste pending any of the operations numbered R 1 to R 12 (excluding temporary storage (being preliminary storage according to the definition of 'collection' in section 5(1)), pending collection, on the site where the waste is produced)".*

4.4 Waste Types and Handling Process Overview

The following section provides a description of raw materials and key elements of the proposed waste transfer process:

4.4.1 Waste Types

CCR will apply for a waste licence to accept non-hazardous wastes (primarily Construction and Demolition, Municipal and Commercial Waste) only at this facility. The wastes will be processed within a Materials Recovery Building with the recyclable materials (e.g. glass, metal, cardboard, wood, woodchips, soils, stone, plastic, paper) removed and the residual waste sent to landfill. Waste sorting

and processing will occur indoors with no such activities proposed in external areas. The proposed facility will accept the following waste types and materials:

- Mixed Municipal Waste;
- Mixed Dry Recyclable Material;
- Wood;
- Glass and glass packaging;
- Bio-Degradable Waste;
- Construction and Demolition, Bulky and Commercial and Household Skip Waste, and;
- Garden Green Waste.

Mixed Municipal Waste

Municipal waste received from both household and commercial inputs will be tipped into the municipal waste storage bay within the warehouse building under negative air pressure with material visually inspected for the presence of contamination or hazardous material. Residual municipal waste will be processed on site and sent for recovery (or disposal when recovery is not feasible). Where this waste is baled it will be stored on site in-line with the site's waste storage plan which will be approved by the Local Authority or EPA under the intended waste consent for the facility.

Proposals to mechanically treat the Mixed Municipal Waste on site will be implemented. Such treatment will be in line with the EPA's guidance document "Municipal Solid Waste - Pre-treatment & Residuals Management - An EPA Technical Guidance document". The waste will be baled and stored internally under negative pressure.

Mixed Dry Recyclable Material

Recyclable Material (mixed paper, cardboard, glass, metal, tetra Pak, plastics) will require very little sorting onsite. These items will be initially inspected onsite to ensure there is no contamination or contaminated material present. Any contaminated material will be removed and placed into a quarantine area. All dry recyclables will then be sorted onsite in designated storage bays.

Wood

Wood will be stored onsite in a designated area and once a sufficient quantity is generated, it will be shredded and transported to a licensed recovery facility.

Glass and glass packaging

Mixed packaging glass will be collected from commercial and household premises and stored in designated storage bays according to glass type i.e. mixed packaging glass (EWC code 15 01 07), plate glass vehicle glass (EWC Code 16 01 20) or plate glass (EWC code 20 02 01). Once a sufficient quantity is generated it will be transported to a licensed recovery facility.

Bio-Degradable Waste

Bio-Degradable waste received from both household and commercial inputs will be tipped into specific enclosed food waste skips within the negative-air building where the material will be visually inspected for the presence of contamination or hazardous material.

Construction and Demolition, Bulky and Commercial and Household Skip Waste

This waste stream will generally consist of rubble, recyclable material and bulky waste brought to the site on skips and from other licensed waste collectors. Commercial and Construction and Demolition (C&D) waste will be initially inspected onsite to ensure there is no contamination or hazardous material present. Any hazardous material identified will be removed and placed into a quarantine area. The waste will undergo manual sorting followed by subsequent mechanical processing.

Garden Green Waste

Biodegradable garden waste composed of garden waste such as grass or flower cuttings and hedge trimmings will be accepted at the proposed facility.

The proposed sorting and transfer facility will not accept hazardous waste of any nature. No disposal of waste will occur at the proposed facility.

4.5 Internal Plant Equipment

The following is a full list of the internal plant infrastructure to be installed at the facility as shown on **Drawing 1010** (**EIAR Volume III**) which will facilitate waste sorting and handling:

- Flexus Baler;
- C&D & C&I Picking;
- Magnetic Separators (ferrous Metal Separator);
- Eddie Current Separators (non-Ferrous Metal Separator);
- Manual Picking Lines;
- Finger Screen Separators;
- Range of Conveyors;
- Colmar Baler B300E;
- Trommell/Screener;
- Powerscreen Trommell 725 LL;
- Bag Opener;
- Skidsteer SC358;
- Komptech MJ5000 Waste Shredder;
- Forklift;
- Excavator;
- 75kW Motor for Negative Air System;
- Compressor for Negative Air System, and
- Flip Flop Separator.

4.6 Capacity of Equipment

Country Clean Recycling (CCR) will to apply to the to the Local Authority or EPA for consent to operate the facility (under Waste Permit or Waste License as appropriate). The EPA was included in the list of statutory consultees to which the scoping document was issued. In a letter dated 26th October 2017 (provided in **Appendix 1.1** of **EIAR Volume II**), the EPA responded, requesting information on a number of points including the following in relation to equipment capacity at the facility:

"*Identify in detail the waste streams proposed to be accepted, the processes to be used in their processing and detailed capacity calculations that demonstrate the proposed facility and its equipment is of a sufficient size to handle the proposed volume of waste"*

To address this request CCR has provided the following information on the maximum capacities of the different equipment which will be utilised at the facility for the different waste streams. It is noted that the capacities discussed below are maximum operating capacities however, each piece of equipment will be operating well below these levels and within the proposed waste throughput of 95,000 tonnes per annum.

Construction and Demolition, Bulky and Commercial and Household Skip Waste

The expected process Mixed Skip Waste (C&D, Commercial & Household Skips & Bulky Waste) will be fed through a skip picking line. The picking line will have the capacity to process 30 Tonnes per hour of material over an 11 hour period which provides a capacity of 330 tonnes per day. The daily rate provides a capacity of over 120,000 tonnes per year which exceeds the overall volume of waste that the facility will process on an annual basis. This ensures the picking line for C&D, Commercial & Household Skips & Bulky Waste possesses surplus capacity to process the expected levels of this waste stream.

Mixed Municipal Waste

Mixed Municipal Waste will be baled and wrapped prior to being sent for recovery or loaded into 40ft ejactor trailers and sent off site to various waste destinations. The equipment required to process this waste stream will include one Flexus Baler, one Loader Shover (Komatsu WA250) and one BobCat. The baler will package up to 30 tonnes of waste per hour which over an 11 hour period, provides a capacity of 330 tonnes per day. The daily rate provides a capacity of over 120,000 tonnes per year which exceeds the overall volume of waste that the facility will process on an annual basis. This ensures the equipment required to bale and wrap mixed municipal waste possesses surplus capacity to process the expected levels of this waste stream.

Mixed Dry Recyclable Material

Mixed Dry Recyclables will be bulk stored on site and loaded into 40ft ejector trailers and sent off site to various waste recycling facilities. The equipment required onsite to sort the recyclables will include a Liebherr excavator (Grab) and the employment of third party permitted hauliers. The excavator will possess the capacity to sort and lift up to 36 tonnes of recyclables per hour over a 5 hour period of use per day, resulting in a loading capacity of 180 tonnes per day and over 65,000 tonnes per year. This level is three times the amount of recyclables material expected to be taken on site and thus there is more than adequate capacity for recyclable sorting and loading at the Little Island facility.

Bio-Degradable Waste

Separately collected bio-degradable waste will be placed in a covered skip inside the waste transfer station and sent off site in compliance with the condition of the waste licence. The equipment required to complete this task will include a covered skip and forklift.

Each covered skip or trailer can be collected up to twice a day, 6 days a week providing 33 tonnes of capacity per day or 10,400 Tonnes per year. The amount far exceeds the proposed levels of bio-degradable waste that will be sorted and removed off site during the operation of the facility.

Garden Green Waste

Separately collected garden green waste will be placed in a skip inside the waste transfer station and sent off site in compliance with the condition of the waste licence. The equipment required to complete this task will include a 40 cubic yard skip and forklift.

Each skip can be collected up to twice a day, 6 days a week and delivered to composting facility within 25km of this site. This level of activity would see 10 tonnes of garden green waste sorted at the facility per day.

4.7 Input Process

The waste streams to be processed at the facility are described in the preceding sections and will be non-hazardous. The facility will not accept liquid wastes. The general process for reception and processing of waste on arrival to the facility is described below:

1. Incoming waste will be weighed on a Precia Molen weighbridge, and then consigned to the material recovery building (MRB). The material will be visually inspected to determine compliance with waste acceptance criteria and large items of timber and metal will be removed mechanically and placed into designated containers. Material that is not readily separated will be fed into a grading machine (e.g. Viper 123 City Sizer) and the action of the vibrating screen box will separate out the soils and the fines. Larger material that does not fall through the screen mesh will be deposited onto a conveyor belt and will pass underneath a powerful over band magnet, which in turn will remove the metal fractions.

2. The remaining material will move through a Viper picking station where recoverable material will be manually picked and deposited into hoppers which will convey the material into suitable containers. Plastic, glass, wood and non-ferrous metals will be separated from the bulk material, with the remaining material consisting of light fractions of paper and plastic, along with a mixture of rubble and stones. As this mixture falls below from the end of the belt, a high velocity air stream will blow the lighter material into a catch net. The heavier material will then fall below into an awaiting receptacle.

3. Any recyclable material recovered is transferred to a suitable manufacturing industry for use as a raw material for further processing.

Operations at the proposed facility will be dependent on the volume of waste streams available for processing. On this basis, the hours of operation across the year are analogous with waste supply and volumes. Processing is expected to occur 12-hours per day, 6 days per week.

4.8 Operational and Opening Hours

Processing operations at the facility will be supported by:

- Operational personnel;
- Warehouse personnel;
- Maintenance personnel;
- Administration personnel; and
- Management.

With the exception of emergencies or as may be agreed, waste will be accepted at or dispatched from the facility between the hours of 5.00 am and 12 Midnight, Monday to Sunday inclusive.

Administration and management personnel work will from 8.00am to 7.00 pm Monday to Friday and 8.00am to 5.30pm on Saturdays. Management are on call 24 hours per day based on a rota basis to ensure all aspects of site operation operate efficiently and quality and environmental issues are addressed immediately as they arise.

4.9 Environmental Management and Emissions

The proposed facility will be operated in accordance with the requirements of the consent to be issued by either the Local Authority (Waste Permit) or EPA (Waste Licence).

CCR will operate an Environmental Management System (EMS) on site and will submit the EMS for the facility to the EPA for approval. The EMS will be in line with the requirements of the EPA waste licence conditions and will cover the following:

- Identification of key environmental impacts of the operational activities;
- The setting of objectives and targets and a programme of improvements;
- Regular monitoring of environmental performance including noise levels within and surrounding the facility, emissions to air from the odour treatment control system and site drainage;
- Regular auditing both by internal and external groups;
- Establishment of operational controls to prevent and minimise significant impacts;
- Regular reporting of environmental performance and production and submission of Annual Environmental Reports (AER) to the Local Authority / EPA as a requirement of the Waste Permit/Licence;
- Monitoring and control systems reviewed and amended;
- Environmental procedures including incident reporting, complaints, and emergency procedures established;
- Provision of environmental awareness training and,
- Operation of preventative maintenance programmes.

As part of the overall environmental management of the site, the facility will have a Community Liaison Officer to act as a formal point of contact and open communication between the company and residents and community groups on matters of environmental performance.

4.10 Pest Control

CCR will ensure monitoring, implementation and training of pest control measures are implemented during the operation of the proposed development. An external pest control contractor will be appointed to undertake monthly site visits to monitor and control the following pests and vermin on site:

- *Rats;*
- *Mice;*
- *Flying Insects;*
- *Cockroach;*
- *Stored Product Insects (SPI), and*
- *Garden ants and crawling insects.*

During each monthly site visit inspections for the above pests will be undertaken and any further pests found on site will be recorded with a report issued to CCR on addressing any additional pests on site. Remains of pests if discovered, will be removed during routine site visits if not already removed by staff onsite.

In addition to the monthly site visits and inspections, a field biologist will be appointed to carry out in depth inspections of the Little Island site at least four times per year to monitor ongoing pest control management at the site, effectiveness of the monthly inspections and propose any additional issues which need to be addressed by CCR.

Predators have not been identified on the proposed Little Island site.

4.11 Process Waste

There will be no discharges directly to surface waters during the construction or operation of the proposed facility.

Waste water emissions from the proposed facility will comprise process waste water and domestic sewage. Process waste water will consist of runoff and washings from waste handling activities within the municipal recycling building. This effluent will be monitored on a monthly basis as per conditions of the Local Authority Permit/EPA Waste Licence.

All process wastewater from the site will be directed off-site to connect with the existing Little Island municipal foul drainage network. Foul drainage at the site will connect into the existing foul drainage network located at the entrance of the development as shown on **Drawing 1007**.

A connection to the municipal sewer network will be established for the sanitary waste waters associated with the office block. Emissions to sewer are solely associated with the sanitary requirements of the office buildings on site, and do not include process water emissions**.**

The drainage for the external hard standing areas will pass through an interceptor (full retention) prior to discharge to the storm sewer connection shown on **Drawing 1006**. Runoff will pass through a 4000 litre full retention oil water separator. Surface water from the roof will pass through a class two interceptor before discharging to the storm sewer. Runoff from the internal floor area will drain via a full interceptor to the foul sewer as shown on **Drawing 1008**.

The proposed surface drainage and foul drainage infrastructure for the facility is shown on **Drawings 1006, 1007 and 1008** provided in **EIAR Volume III.**

Leachate run off will be kept to a minimum. Municipal waste will be processed once delivered to site so there will be no leachate from its storage. The waste will be sealed within 10 layers of strong plastic wrap (1200-gauge polyethylene) to make sure there is no leachate released from the bales.

Process waste effluent generated from waste handling activities within the Materials Recovery Building, together with washings and surface water from hardstanding areas of the site will be monitored on a monthly basis as per conditions of the proposed permit/licence.

4.12 Emissions to Atmosphere

All waste processing will be carried out inside the Materials Recovery Building (MRB). The MRB has been designed to include a comprehensive, state of the art, odour treatment control system. The

system will be a *Simdean Envirotec* designed and commissioned air pollution and odour control system with custom-designed tanks and process vessels in a range of corrosion resistant materials. The system manages odours on site and collects the air from the waste tipping areas within the MRB under negative pressure.

Air emissions at the facility arise from heat generation systems and minor emissions from the odour treatment system. Other air emissions include pressure relief valves (PRV's) which are infrequent and air vents from storage areas. These sources are negligible in relation to environmental effect and are therefore not deemed necessary for monitoring by the Local Authority/EPA. A description of the air quality and odour assessment is provided in **Chapter 9 - Air Quality and Odour and Appendix 9.1.**

4.12.1 Odour Management System

The proposed odour management system for the Little Island facility is made up of a number of different elements to satisfy the principles of odour control and includes odour containment, odour extraction, capture and treatment. Each element will be installed at the Little Island facility and will be dry and wet commissioned, examined and verified as installed appropriately and adequately.

The inlet ductwork will be located and installed within the waste transfer station to enable the required number of air extractions from the building, which are shown on **Drawing 1010** provided in **EIAR Volume III**. The building will be fitted with fast opening doors to enable the required areas to be kept under negative air pressure to prevent fugitive emissions escaping.

Odour Containment System

The proposed odour containment system will be made up of a number of different elements to include: division of the overall building footprint into a smaller more manageable footprint by insertion of dividing walls and isolation of the mixed municipal waste (MMW) reception, processing and storage area from the rest of the internal areas which will contain non-odour emitting processes.

Division between the non-odour emitting dry and construction and demolition recycling waste process with the more malodourous MMW handling, processing and bailing provides for the application of a more manageable odour extraction rate from the facility building. The division walls will reduce the overall building footprint requiring odour extraction by nearly 50%.

In terms of odour containment, all process buildings will be sealed with a near 100% leak proof building fabric (i.e. leakage rate of less than 3 m3/m2/hr @ 50 Pa). All processes external to the building fabric will be enclosed and sealed with negative extraction applied to ensure no fugitive emissions of odours during operation. All waste handling and pre-processing activities will be carried out indoors at the facility. The building will be placed under negative pressure. A total extraction volume flow rate of up to 155,000 Nm3/hr will be applied to the process buildings to achieve negative pressure at a minimum of 3 air changes (AC) per hour.

The waste intake buildings will be fitted with rapid roller doors which will be interlocked and fitted with air curtains so as to maintain good building integrity in terms of odour containment (main access doors only) when doors are opened intermittently during delivery/removal of material. In addition to this, the main facility building will be fitted with absolute pressure controlled fresh air intake louvers in order to control the negative pressure placed upon the building.

The building will be tested for effective negative pressure application by means of closing up all door openings and application of negative extraction by means of the odour control system extraction fans.

The building under pressure will be continuously measured by means of static pressure sensors to verify that the building remains under negative pressure. The negative pressure set-point will be in excess of 10 to 15 Pascals (Pa). This will demonstrate that the building is effectively sealed and therefore will minimise any odour leakage from the process building even in the absence of negative pressure application.

As part of the overall odour containment system, a number of strategically located fresh air intake negative pressure controlled louvre systems will be installed on the building elevations, as shown on **Drawings 1010 to 1012** provided in **EIAR Volume III**.

This system automatically opens or closes depending on the applied negative pressure placed upon the building by the main extraction fans. These are continuously monitored by means of applied negative pressure sensors which control the ingress of air into the building while ensuring that the negative pressure applied to the building envelope is maintained above 10 to 15 Pa.

Odour Capture and Extraction

In terms of odour capture, a network of extraction pipework will be fitted throughout the bailed waste storage and Food and Refuse area building rooms so as to provide negative pressure extraction to all odour generation areas located within the facility building. This will be ducted to the odour control system for treatment. The ductwork will be fitted with a number of volume control extraction grills to allow for the focused extraction of odours from dedicated areas located along the extraction pipework.

Two fans VSD controlled fans will be connected to the ductwork whereby odourous air will be extracted and ducted to the odour treatment plant. The odour treatment plant will consist of a Reverse jet pulse filter (RJP), followed by plasma injection and carbon filtration and all treated air vented through a 16 m vent for final dispersion.

The RJP will treat all incoming air for the removal of dust with greater than 99.5% of all dust greater than 2µm in size. This will prevent any significant issues with the carbon filtration vessels. The air will then be treated with the addition of gas plasma whereby plasma will be injected into the air stream upstream of the main extraction fans. This will promote the oxidation of odourous compounds and also lead to a promotion of odourous compound breakdown adsorbed into the carbon. The air will travel to two carbon filtration vessels whereby the air will be filtered of odourous compounds before being exhaust to atmosphere through a 16 m vent.

It is anticipated that the odour control system will achieve an exhaust odour threshold concentration of less than 250 Ou_E/m^3 on the exhaust. This will ensure that odours above the recommended EPA guideline levels at ground level will not be exceeded.

The overall odour control system will be fitted with a SCADA monitoring system whereby building under-pressure monitoring system, door operation, fans, RJP, plasma injection system and carbon filtration vessels will be monitored for parameters such as pressure, temperature, consumed power and operation efficiency.

The system has been designed with 100% duty and 50% standby in mind so that odour treatment coverage is available during routine maintenance of the system.

Odour Treatment System

All malodourous air extracted from the facility will be passed through a regenerative dust filtration system before being passed through two activated carbon filtration systems for removal of dust and odours. All treated air will then be directed to a common dispersion stack as a means of added security.

Figure 4.1, provided in **EIAR Volume III** provides a simplified process diagram of the proposed air treatment system.

The installed dust filtration system will be based on high efficiency cartridge based technology with a fully synthetic cartridge installed providing dust removal down to very high efficiencies (i.e. 99.9% RE) and very low particle size (i.e. less than 2 µm particle size). This will ensure that all air directed to the carbon filter will be free of dust and thereby will not allow the carbon to be blocked. A regenerative jet pulse (RJP) dust filter will be monitored by means of differential pressure sensors. This will activate the cleaning cycle when a high set point back pressure is achieved and the system will self-clean through operation until the lower set point is achieved.

The regenerative dust filter will be examined and verified to be installed appropriately. Diagnostic tests will be performed also on the outlet of the system to verify integrity. Appropriate poly spun synthetic filters will be installed in the system. A stand-alone fully SCADA monitored compressed air feed will be installed to provide -400°C dew point air at 6-bar pressure.

When the air is de-dusted, this dust free air will be directed towards two individual carbon filters each capable of treating 40,000 m^3/hr of malodourous air continuously and 50,000 m^3/hr intermittently. Each carbon filter will be filled with a total carbon weight of approximately 20 tonnes each. Each vessel will be filled with a virgin steam activated bituminous coal pelletised carbon. Each system will be annular design and will be mounted off the ground so as to allow for ease of emptying.

Following treatment in the carbon filters, the treated air will be directed to the standalone 16m vent for dispersion as shown on **Drawing 1011.**

Following installation of the odour control system, the overall operation of the system will be verified through odour assessment and measurement. The expected exhaust odour threshold concentration will be less than 250 ouE/m^3.

A full odour assessment and dispersion modelling (ADM) report has been prepared and is appended to this EIAR in **Appendix 9.1.**

SCADA Monitoring and Control System

The entire odour extraction and treatment system including all ancillaries which include doors, louvres, etc., will be monitored by means of various sensors installed throughout the system. The main sensors to be installed include static pressure, temperature and digital system outputs. This data will be collated in the SCADA system and alarm tags will be established to alert the operators of any operation issues with the system, during dry and wet commissioning.

4.13 Noise

Due to the nature of the activity at the site, all processing of waste will occur indoors. The building fabric will attenuate much of the noise to the external environment. Regular inspections and preventative maintenance will be carried out on external equipment to ensure that it operates as designed and is not causing noise in excess of the design. Maintenance personnel will be present on

site at all times of operation and can respond immediately to any equipment which malfunctions, causing noise emissions during service.

Fans on the external façade of the building will be covered in noise reduction lagging and foam to make sure noise limits comply with the onsite waste permit/license

An assessment of proposed noise emissions in relation to the proposed development is provided in **Chapter 8 - Noise and Vibration.**

4.14 Drainage Infrastructure

Drainage infrastructure such as gravity drains, silt traps and storm drains will be built into the floor area of the waste transfer building as shown on **Drawing 1008 (EIAR Volume III)** to ensure all run off form site operations is channelled and controlled**.** Surface water from the roofs will drain to the proposed drainage system on the site as shown on **Drawing 1006**. The receiving drain has adequate capacity to cater for the development. Surface water emissions will be monitored in accordance with the Waste Licence being applied for. An underground firewater retention tank will be installed on the southern boundary of the waste transfer station as shown on **Drawing 1025**.

4.15 Water Supply

The proposed facility will connect with the existing Cork Metropolitan municipal water supply via the connection point shown on **Drawing 1003**. The proposed facility will utilise approximately $10m^3$ per day. Water usage will serve toilet and wash room utilities and site cleaning water will be used to wash down the floor and cleaning of site on a weekly basis or as required.

4.16 Utility Usage

The proposed facility will utilise approximately 8,500 KWh/Week of electricity. Other power sources such as gas will not be used on site.

4.17 Roads, Access and Internal Movements

The proposed site is currently accessed via the main access road to Harbour Point and Courtstown Business Parks (Harbourpoint Business Park Road). The main business park access road leads to Ballytrasna Park to the north, and meets this road in the form of a simple priority junction as discussed further in **Chapter 14 Traffic and Transport**.

The proposed development will operate a one-way system for HGV deliveries to the site. The proposed site entrance and new exit gate layout for the site is shown on **Drawings 1002** and **1024** provided in **EIAR Volume III**. New site signage is also proposed at the entrance, the details of which are shown on **Drawing 1023.**

Delivery HGVs carrying domestic refuse and food waste will enter the site via Harbourpoint Business Park Road on the eastern boundary of the site and enter the weighbridge on the eastern boundary for recording. HGVs will continue north around the building towards the north western corner of the building where it will access via an automatic 6m high door as shown on **Drawing 1018.** These vehicles will then travel within the building to the food and refuse area where domestic refuse and food waste will be off loaded for processing. The HGV will then exit via a separate automatic exit door in the north west corner of the building before continuing onto the weighbridge for recording and then out of the site entrance/exit onto Harbourpoint Business Park Road.

HGVs carrying dry recycling and skips will enter the site via Harbourpoint Business Park Road and enter the building via the same route as taken by the domestic refuse and food waste HGVs, as shown on **Drawing 1019**. The HGVs will unload their materials in the north west corner of the building for processing and will exit the building using the separate automatic exit door and site exit route as the HGVs carrying domestic refuse and food waste. These trucks will be recorded on the weighbridge when entering and leaving the site.

Food waste and refuse is collected by HGVs at the loading bays located on the eastern boundary of the building as shown on **Drawing 1020.** These bays are used for collection only. Collection HGVs enter the site via the Harbourpoint Business Park Road entrance and then reverse into the loading bay. Once loaded, the HGVs exit the site before via their entrance route.

HGVs collecting separated and sorted bales will access the site via Harbourpoint Road and be recorded in the weighbridge on the eastern boundary of the site before driving around the north western corner of the building and entering the bales storage area via a separate automatic entrance door on the western elevation of the building as shown on **Drawing 1021**. These HGVs will then leave the site via the new exit gate (shown on **Drawing 1024**) onto Harbourpoint Business Park Road in the south eastern corner of the site

Site office staff will enter the site via the Harbourpoint Road access and will follow the site roads on the north section of the site to the designated parking area surrounding the office in the north western corner of the site. Office staff will exit the site via this same entrance route.

Chapter 14: **Traffic and Transport** below assesses the potential impacts of site related traffic serving the proposed waste transfer and recycling plant.

4.18 Waste Storage

All waste material will be stored on site in line with the site's Waste Management Plan which will form part of the Local Authority Permit/EPA Waste Licence. This will ensure that waste is stored in an orderly manner in line with the carrying capacity of the site.

4.19 Waste Recycling and Transfer Station Construction Methodology

The outline construction methodology is discussed under the following headings:

- Expected Duration of Works;
- Contractor's Compound and Welfare Facilities;
- Proposed Sequence of Work and Methodology;
- Control and Mitigation Measures; and
- Record Keeping.

4.20 Expected Duration of Works

The overall project duration is expected to be approximately 12 to 15 months. Upon completion and acceptance of the process and structural designs required to construct the waste recycling and transfer facility in the Courtstown Industrial Park, construction works will commence.

4.21 Contractor's Compound and Welfare Facilities

A temporary site compound will be established in the north western corner of the site as shown on **Drawing 1022** provided in **EIAR Volume III** to accommodate site offices, welfare facilities, storage containers, material lay down areas and parking of contractor's vehicles and plant. The contractor will be obliged to ensure that the compound is properly designed and maintained throughout the construction period. Facilities to be provided in the temporary site compound will include the following:

- diesel generator;
- employee parking;
- portaloo;
- bunded fuel storage;
- contractor lock-up facility;
- a water tanker to supply water used for other purposes; and,
- waste disposal and recycling area.

Portable cabin structures will be used to provide temporary site offices and a toilet block will be installed compatible with a waste storage tank. These port-a-loo toilets will be emptied on a weekly basis or earlier if required. Container storage units will be provided for holding tools and materials.

A potable water supply will be accessed via the existing municipal supply servicing Courtstown Industrial Park and temporary power will be provided by the Contractor in the form of portable generators. Telecommunications will be provided using mobile phones/broadband.

The site compound is to remain in place until construction of the waste transfer warehouse is completed, at which point the different elements of the compound will be temporarily relocated within the waste transfer building to enable the commencement of construction of the site offices in this part of the site. The compound area will be then be developed into the site office.

4.22 Proposed Sequence of Works Methodology

4.22.1 Site Entrance, Access Roads and Drainage Works

The proposal involves the modification of the existing site access followed by excavation and construction of a new 6m wide two way internal access road to facilitate suitable access around the site.

Standard road construction techniques will be used and the road will be paved with a black tarmac surface to match existing road and car parking areas. Road gullies will be provided to facilitate drainage to the existing surface water drainage system located near the site entrance.

4.22.2 Site Enabling and Earthworks

The construction phase of the proposed development will involve the excavation of soils for foundation pouring to provide a base for the new building. It is expected that soil excavations for foundation construction associated with the development will be to be up to 2.5m deep in most areas of the site, with deeper excavations envisaged near the site entrance and to allow for the installation of the firewater retention tank. Temporary mounds of excavated material will be stored along the western boundary of the site as shown on **Drawing 1022**, provided in **EIAR Volume III.** A 225mm perforated land drain will be installed on both sides of the excavation mounds to collect and contain

run off, which will connect into a 225mm diameter PVC Storm Pipe located within the site compound which will act as the primary site drainage mechanism and will connect to the existing storm manhole at the site entrance. The land drains will be wrapped in theram to prevent sediments getting into the storm pipe. A Bypass Separator will be installed just inside the site entrance which will be cleaned out regularly. A detailed description of the mitigation measures to be installed during the construction stage to prevent run off and contamination of ground and surface water bodies is provided in chapters 6 and 7 below and in the outline Construction Environmental Management Plan provided in **Appendix 6.3, EIAR Volume II.**

All excavated materials during foundation construction will be used for reinstatement works surrounding the warehouse infrastructure, including the formation of an embankment lining the area of trees along the western boundary of the site as shown on **Drawings 1001** and **1026** provided in **EIAR Volume III**. Any excess materials will be disposed of to a licensed disposal facility.

4.22.3 Construction/Installation of Building Plant Items

The proposed development building includes the installation of waste transfer facility, a two-storey office building, ESB sub-station and associated site works including two weighbridges, ramps and associated parking bays. The foundations and rising walls will be cast in place. The structural steel frame of the warehouse building will be subsequently erected. The cladding will also be installed at this stage. The floor of the building will then be constructed. The office block will be of traditional construction and will progress upon completion of the main warehouse building.

4.22.4 Record Keeping

Records of all works associated with the overall construction of the project shall be developed by the contractor and the project manager as the project proceeds. Where necessary as requested by the Local Authority, copies of relevant construction activity records can be made available.

Prior to the Contractor departing site a complete set of the following shall be made available to the Developer:

- Copy of safety file;
- Constructed records of construction works, and
- Environmental records (waste records, inspection records, monitoring and results, audits etc.)

4.22.5 Electrical Installation and Commissioning

Once the civil and mechanical works have been substantially completed the electrical installation will commence. This will involve the wiring to facilitate all machinery. It will also include the installation of all requirements of the Fire Safety Certificate.

5 Chapter Five – Biodiversity

5.1 Introduction

This Chapter presents the factual biodiversity information gathered during the desk and field study assessment of the proposed waste transfer facility. 'Biological diversity' or biodiversity is, according to the UN Convention on Biological Diversity (BCD) defined as being the '*variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.'*

Article 3 of the EIA Directive 2014/52/EU states 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:

(b) biodiversity, with particular attention to species and habitats protected under Directive 32/43/EEC and Directive 2009/147/EC.

The potential impacts (direct, indirect and cumulative) of the proposed development on biodiversity including terrestrial ecology present within the site and surroundings are qualitatively assessed in this section. Mitigation measures to be implemented in the construction and operational phases are proposed to minimise identified impacts on terrestrial ecology. Figures referred to in this chapter are provided within **EIAR Volume III** while Appendices that are referred to are presented in **EIAR Volume II**.

The potential impacts of the proposed waste transfer development on the Natura 2000 network of sites (European sites known as Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) have been assessed in a standalone Appropriate Assessment Screening Report which accompanies the application as **Appendix 5.2,** provided in **EIAR Volume II: Appendices**.

5.2 Competent Expertise

This chapter of the EIAR was prepared by Dr Patrick Crushell and Mr. Brendan Kirwan, ecologists with Wetland Surveys Ireland Ltd. Dr. Crushell (BSc Applied Ecology; MSc Environmental Resource Management, PhD Environmental Sciences, MCIEEM) received an honours degree in Applied Ecology from UCC, a Master's degree in Environmental Resource Management from UCD and defended his PhD at Wageningen University, the Netherlands. He is a Full Member of the Chartered Institute of Ecology and Environmental Management (MCIEEM). Dr. Crushell has been working in the area of nature conservation and ecological impact assessment for the past sixteen years. Projects that he has been involved in include wetland inventory surveys; evaluation of proposed designated sites; restoration and management of peatland habitats; baseline ecological surveys and impact assessments of various development proposals including road, quarries, wind-farms, waste facilities, arterial drainage schemes, and residential developments; during and post-construction, ecological monitoring.

Brendan Kirwan (BSc Wildlife Biology, ACIEEM) received an honors degree in Wildlife Biology from IT Tralee. He is an Associate Member of the Chartered Institute of Ecology and Environmental Management (ACIEEM). He has experience in the field of ecological assessment and environmental management since graduating in 2012. Since joining Wetland Surveys Ireland in 2013, he has undertaken a wide range of baseline ecology surveys and contributed to impact assessments of various development proposals.

5.3 Objectives of the Biodiversity Assessment

The objectives of the biodiversity assessment were:

- To carry out a desktop study in order to determine the previously recorded biodiversity of the area;
- To carry out a baseline biodiversity survey of the development site and surroundings;
- Evaluate the biodiversity value of the development site and surroundings;
- To predict and assess the potential direct, indirect, and cumulative impacts of the proposed development, and
- To propose mitigation measures in the construction and operation phase of the development so as to minimise potential impacts on flora and fauna.

5.4 Project Description

The proposed development site is located in the townland of Courtstown, Little Island, Co. Cork. The site comprises unmanaged recolonising bare ground and grassy verge habitats. Field boundaries are defined by hedgerows and a treeline. The proposed development site is approximately 1.5ha in extent and occurs on moderately sloping terrain at an altitude ranging from 25m to 29m asl.

The proposed waste transfer and recycling station is not located within any site designated for nature conservation. The nearest designated sites are the Great Island Channel cSAC and the Cork Harbour SPA, both of which are located approximately 0.4km south- east of the proposed development.

The proposal comprises the construction of a waste transfer and recycling facility on a greenfield site in Courtstown industrial estate, Little Island, Co. Cork. The proposal follows a previously permitted application on the site for a waste transfer facility, the permission duration of which was extended in 2012, as discussed above in section 1.5. The proposal comprises the construction of the following buildings and ancillaries:

- Waste transfer and recycling station;
- Site office;
- ESB sub-station;
- Wheel wash facility; and
- Weigh bridge.

The development complies with the specific zoning requirements for the site, industry and enterprise.

5.5 Study Area

The proposed development site is located within a greenfield site in Courtstown industrial estate, Little Island, Co. Cork. The waste transfer and recycling facility is proposed within an area of approximately 1.5ha of unmanaged grassland adjacent to existing warehouses to the east and south of the site. A former golf course occurs immediately to the west of the proposed development site. The Great Island Channel occurs ca 0.5km south-east of the proposed development site. There are no watercourses within the proposed development site and therefore no direct surface water connectivity to the channel.

5.6 Methodology

Data required to carry out the assessment was collected following both a desktop review and field surveys as described further below.

5.6.1 Statutory Context

This appraisal has consideration to the following legislation:

- Consolidated EIA Directive 2011/92/EU;
- Wildlife Acts 1976-2012;
- The Habitats Directive 92/43/EEC;
- The Birds Directive 2009/147/EC;
- The European Communities (Birds and Natural Habitats) Regulations 2011 [S.I. No. 411 of 2011];
- European Communities (Environmental Impact Assessment) (Agriculture) Regulations 2011 [S.I. No. 456 of 2011];
- European Union (Environmental Impact Assessment and Habitats) Regulations 2011 [S.I. No. 473 of 2011];
- European Union (Environmental Impact Assessment and Habitats) Regulations 2012 [S.I. No. 246 of 2012]; and
- Flora (Protection) Order, 2015.

In addition, in considering the ecological impacts of the proposed development regard was made to the following guidance and information documents:

- CIEEM (2016) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition. *(Chartered Institute of Ecology and Environmental Management)*;
- DAHG (2011). *Irelands National Biodiversity Plan: Actions for Biodiversity 2011 – 2016*;
- EPA (2002). *Guidelines on the information to be contained in Environmental Impact Statements*;
- EPA (2003). *Advice notes on current practice (in the preparation of Environmental Impact Statements)*;
- Fossitt (2000). *A Guide to Habitats in Ireland*;
- Smith *et al.* (2011). *Best Practice Guidance for Habitat Survey and Mapping in Ireland*.
- NRA (2009). Guidelines for Assessment of Ecological Impacts of National Road Schemes (Revision 2).

5.6.2 Desktop Review

A desktop review was carried out to identify features of ecological importance within the study area and the surrounding region. Literature sources consulted are included in the text and listed at the rear of this chapter. A review of designated sites was carried out as part of the desktop study using GIS shapefiles and published site information available from the National Parks and Wildlife Service (NPWS).

5.6.3 Field Surveys

Multidisciplinary field surveys (following National Road Authority guidance (NRA 2009) of the site were carried out over two days, the 24th of November, and the 29th of December 2016 to assess the habitats, vegetation, birds, and mammals within the site as described in the following paragraphs.

Target notes were taken relating to habitats, species, and landuse encountered during the survey, including notes on dominant vegetation, qualitative assessment of plant species diversity, vegetation structure, topography, drainage, disturbance, and land use. The habitats encountered on site were

classified in accordance with Fossitt (2000). These methods that were followed during the habitat survey and subsequent mapping followed best practice guidance as outlined by Smith *et al*. (2011).

Target notes to record bird species (seen and heard) encountered during surveys were recorded. The abundance and behaviour was recorded. An assessment was made of the site's potential to support bird species of conservation importance was also undertaken. All evidence of mammal species was also recorded and the site was assessed for any mammal activity. All signs and tracks (Bang and Dahlstrom 2004) were assessed as they were encountered in the field. Suitable mammal habitat within and surrounding the site was also noted.

5.6.4 Evaluation of Ecological Significance

The impact significance is a combined function of the value of the affected feature (its ecological importance), the type of impact and the magnitude of the impact. It is necessary to identify the value of ecological features within the study area in order to evaluate the magnitude and significance of possible impacts.

The method of evaluating ecological significance used in this study is based on guidelines issued by CIEEM (2016) and the NRA (2009). The results of the habitat and fauna surveys were evaluated to determine the significance of identified ecological features located in the study area on an importance scale ranging from international - national - county - local. The local scale is approximately equivalent to one 10km square but can be operationally defined to reflect the character of the area of interest. Because most sites will fall within the local importance scale, this is sub-divided into local importance (high value) and local importance (low value). The criteria presented in **Appendix 5.1, EIAR Volume II** have been used in assessing ecological value. In addition to these criteria, the evaluation also considers other factors such as potential ecological value, secondary supporting values where habitats may perform a secondary ecological function, and social values of an ecological feature such as educational, recreational, and economic value.

5.6.5 Assessment of Impacts and Impact Significance

The assessment of impacts is based on guidance offered by the Chartered Institute of Environmental and Ecological Management (CIEEM 2016) with reference to national guidance in NRA (2009), the EPA (2002), and Gittings (1998). Impacts are discussed and assessed in relation to impact type (positive, neutral or negative), character and sensitivity of the affected feature, magnitude, duration, timing and frequency. Criteria for assessing impact type and magnitude are presented in **Appendix 5.1.** In assessing the magnitude and significance of impacts it is important to consider the value of the affected feature.

5.6.6 Survey Constraints and Limitations

The field surveys were carried out during the sub-optimal winter season, the identification of vegetative species is compromised during the winter months. However, considering the character of the receiving environment (dry meadows / grassy verge habitat and recolonising bare ground within an industrial suburban setting) and the nature of the project it is felt that the surveys are adequate to provide the necessary baseline information to present a comprehensive assessment of impacts on flora and fauna.

5.7 Baseline Description of Existing Conditions

5.7.1 Designated Sites

The location of designated sites in relation to the proposed development site is illustrated in **EIAR Volume III: Figure 5.2**. Summary details of those sites that occur within a 5km radius of the site are presented in Table 5.1 below.

The proposed development site does not lie within any sites designated or under consideration for designation for nature conservation. Two European designated sites occur within proximity to the proposed development site; Great Island Channel cSAC (NPWS Site Code: 001058) and the Cork Harbour SPA (004030). A single site of proposed national importance, the Great Island Channel pNHA (NPWS Site Code: 001058), is located within 0.4km of the development site. In this area all three designated sites are spatially overlapping.

Candidate Special Areas of Conservation (cSACs) are sites of international importance due to the presence of listed habitats or species that are of European importance. The nearest cSAC to the proposed development is the Great Island Channel cSAC that occurs ca 0.4km south-east of the proposed development site at its nearest point. The cSAC is designated for two Annex I habitats listed on the EU Habitats Directive.

Special Protection Areas (SPAs) are internationally important sites designated for the protection of endangered species of wild birds. SPAs are selected for one or a combination of the following:

- Listed rare and vulnerable species (as listed on Annex I of the EU Birds Directive 2009/147/EC);
- Regularly occurring migratory species, such as ducks, geese, and waders; and,
- Wetlands, especially those of international importance, which attract large numbers of migratory birds each year.

The nearest SPA to the proposed development site is the Cork Harbour SPA which occurs ca 0.4km south-east of the proposed development site at its nearest point. The site is designated for important populations of 23 bird species, including 4 species listed on Annex I of the EU Birds Directive (see Table 5.1.1 below).

Natural Heritage Areas (NHAs) are sites of national conservation importance and are offered protection under the Wildlife Amendment Act 2000. The nearest proposed NHA to the development site is the Great Island Channel pNHA (NPWS Site Code: 001058) located approximately 0.4km south-east of the proposed development at its nearest point (overlapping the cSAC). The site is a proposed (p)NHA having not yet gone through the formal designation process.

Table 5.1: Designated and proposed designated conservation areas within 5km of the proposed development site at Courtstown, Little Island, Cork City.

Site Name	Site Code	Site Description	Distance and direction from site
Great Island Channel cSAC / pNHA	1058	The Great Island Channel is an integral part of Cork Harbour which contains several other sites of conservation interest. The main habitats of conservation interest in Great Island Channel SAC are the sheltered tidal sand and mudflats and the Atlantic salt meadows. The site is an integral part of Cork Harbour which is a wetland of international importance for the birds it supports. The site is of major importance for the two habitats listed on Annex I of the E.U. Habitats Directive, as well as for its important numbers of wintering waders and wildfowl. It also supports a good invertebrate fauna.	The cSAC / pNHA occurs approximately 0.4km to the south-east of the proposed development site at its nearest point.
Cork Harbour SPA	4030	Cork Harbour is a large, sheltered bay system, with several river estuaries. Cork Harbour is of major ornithological significance, being of international importance both for the total numbers of wintering birds (i.e. > 20,000) and also for its populations of Black-tailed Godwit and Redshank. In addition, it supports nationally important wintering populations of 22 species, as well as a nationally important breeding colony of Common Tern. Several of the species which occur regularly are listed on Annex I of the E.U. Birds Directive, i.e. Whooper Swan, Little Egret, Golden Plover, Bar-tailed Godwit, Ruff, Mediterranean Gull and Common Tern. The site provides both feeding and roosting sites for the various bird species that use it. Cork Harbour is also a Ramsar Convention site and part of Cork Harbour SPA, which is a Wildfowl Sanctuary.	The SPA occurs approximately 0.4km south-east of the proposed development site at its nearest point.
Rockfarm Quarry, Little Island pNHA	1074	The area is of considerable interest botanically because of its species diversity and the presence of 'varieties' for the region, such as the dense-flowered orchid and Portland spurze. Geologically the area is unique, being the only exposed reef of limestone in Cork, it is also different from the reef limestone faces which are more typical of the north midlands scenery	The pNHA is located approximately 0.6km to the south-west of the proposed development site. The site is sufficiently removed and ecologically isolated from the development site that potential impacts are not foreseen and therefore the site is not considered further in this report.

Site Name	Site Code	Site Description	Distance and direction from site
Douglas River Estuary pNHA	1046	This is a large site situated in the north-west corner of Cork Harbour, stretching from Blackrock to Passage West. It is an integral part of Cork Harbour. The prime importance of this site is its birdlife; this site is of interest because it is an essential part of the Cork Harbour complex and contains much higher densities of waders than would be expected from its relative size. It is ranked as the second most important area within the harbour.	The Douglas River Estuary pNHA occurs approximately 2.3km west of the proposed development site. The site is sufficiently removed and ecologically isolated from the development that potential impacts are not foreseen and therefore the site is not considered further in this report.
Dunkettle Shore pNHA	1082	This site is located at the mouth of Glashaboy River, where it meets the Lee estuary, on the eastern edge of Cork city. The site is of value because is mudflats provide an important feeding ground for waterfowl and it acts as a significant roost for birds in the upper harbour. Furthermore, it is an integral part of Cork harbour which is an internationally important wetland, regularly holding flocks of over 20,000 waterfowl.	The pNHA occurs ca 3km north-west of the proposed development site at its nearest point. The site is sufficiently removed and ecologically isolated from the development that potential impacts are not foreseen and therefore the site is not considered further in this report.
Glanmire Wood pNHA	1054	Glanmire Wood occurs on the east bank of the Glashaboy River, immediately south of Glanmire village. The main habitat of interest is mixed broad-leaved woodlands dominated by oak (*Quercus* sp.), beech (*Fagus sylvatica*) and sycamore (*Acer pseudoplatanus*) with a few conifers, especially Silver Fir (*Abies alba*). This site is of interest because this type of woodland is rare in east Cork. The tidal river below the wood adds to the diversity of the site with patches of saltmarsh.	The Glanmire Wood pNHA occurs ca 4.3km north-west of the proposed development site. The site is sufficiently removed and ecologically isolated from the development that potential impacts are not foreseen and therefore the site is not considered further in this report.

Evaluation: Two internationally important sites occur within approximately 0.4km of the proposed development site. The Great Island Channel cSAC, and the Cork Harbour SPA both occur approximately 0.4km to the south-east of the proposed development site. An Appropriate Assessment (AA) Screening Report is presented in **Appendix 5.2, Volume II** of this EIAR. The AA Screening Report concluded that the proposed development is not directly connected with or necessary to the management of European sites.

5.7.2 Habitats and Vegetation

Habitats that occur within and surrounding the proposed development site are described in the following paragraphs. Habitats are classified according to Fossitt (2000).

Following the multidisciplinary surveys of the site, the different habitat types identified (as classified according to Fossitt 2000) were mapped. The habitat map showing the distribution and extent of

habitats within the site is presented in **Figure 5.1, EIAR Volume III** an evaluation of habitats that occur within the proposed development site is presented in Table 5.2.

Dry meadows and grassy verges (GS2)

Dry meadows and grassy verges habitat occurs throughout much of the site (see **EIAR Figure 5.1** and Plate 5.1. below), occurring on gently sloping terrain. This unmanaged grassland is dominated by grass species with an abundance of herbs. Grass species that commonly occur include bent grasses (*Agrostis* spp.), Yorkshire fog (*Holcus lanatus*), and cocksfoot grass (*Dactylis glomerata*). An abundance of willow herb (*Epilobium* spp.), thistle (*Cirsium* spp.), ragwort (*Senecio jacobaea*), and wild angelica (*Angelica sylvestris*) occurs throughout. Bramble (*Rubus fruticosus* agg.) and gorse (*Ulex galii*) scrub encroachment occurs locally within this area.
Evaluation: This habitat is of local importance, lower value, it provides suitable foraging habitat for common passerine bird species.

Plate 5.1: Dry meadows and grassy verges habitat.

Recolonising bare ground (ED3)

Recolonising bare ground habitat occurs frequently to the south and east of the proposed development site in proximity to existing warehouses (buildings and artificial surfaces, BL3) (see **EIAR Figure 5.1** and Plate 5.2 below). An abundance of pioneer species such as chickweed (*Stellaria media*), pineapple weed (*Matricaria discoidea*), and ribwort plantain (*Plantago 46anceolate*) are common in these sections of the site. Immature stands of willow (*Salix* cinerea), and butterfly-bush (*Buddleja davidii*) also occur within this habitat along the eastern sections of the site.

Evaluation: This habitat largely occurs on modified land (gravel, and concrete). Non-native invasive butterfly bush also occurs within this habitat type. This habitat is considered to be of low ecological value.

Plate 5.1.2: Recolonising bare ground habitat along the eastern site boundary of the proposed development site.

Scrub (WS1)

Small areas of willow and gorse scrub occur along the eastern sections of the site adjacent to existing warehouse facilities. Gorse (*Ulex europaeus*) and willow are also common along hedgerows that define field boundaries. Bramble scrub occurs along the western and northern sections of the site, adjacent to hedgerow and treeline.

Evaluation: The scrub habitat within the site is not considered to be of particular value to mammal species. This habitat provides foraging and sheltering opportunities to common passerine birds.

Other habitats

Small sections of dense bracken (HD1) occur locally, particularly within the north-eastern sections of the site and adjacent to the northern site boundary. This habitat is considered to be of low ecological value.

The northern and eastern site boundaries are defined by hedgerows (WL1). The hedgerow along the northern boundary comprises an ivy (*Hedera helix*) covered overgrown hawthorn (*Crataegus monogyna*) hedgerow approximately 4 – 6m high. Large ash (*Fraxinus excelsior*) stands occur along the western sections of the hedgerow, with an earthbank ca 1.3m high occurring along the base of the hedgerow. Bramble and bracken (*Pteridium aquilinum*) dominate the ground flora adjacent to this hedgerow. The eastern site boundary comprises a hedgerow with willow, birch (*Betula pubescens*), and immature oak. A large earth bank occurs along the east of the hedgerow.

A mature treeline (WL2) defines the western site boundary of the site. The treeline comprises conifers and broadleaves ca 12 to 16m high. The treeline occurs along an earthbank c 1.2m high, adjacent to a mixed broadleaved woodland. Species that occur along the treeline include Lawson's Cypress (*Chamaecyparis lawsoniana*), and firs, with ash, sycamore (*Acer pseudoplatanus*), and white poplar (*Populus alba*). Dense ivy cover occurs along the treeline with an understorey comprising hawthorn, and elder (*Sambucus nigra*).

Evaluation: Treeline and hedgerow habitat provide nesting and foraging opportunities for common passerine bird species, and may potentially provide foraging / commuting opportunities for bat species. Hedgerows and treeline along the site boundaries are considered to be of local importance, higher value.

5.7.3 Plant Species

Common plant species recorded during the field survey are included in the habitat descriptions above. During the field survey, habitats were also assessed as to their potential suitability for rare or protected plant species with reference to Preston *et al.* (2002); the Flora Protection Order 2015, Annex II of the EU Habitats Directive, NPWS rare plant databases, and the Irish Red Data Book (Curtis and McGough 1988).

Searches of the NPWS Rare Plant Database, and the National Biodiversity Data Centre Biodiversity Maps were conducted for previous records of rare and protected plant species (with reference to Red Data Book, Annex II, IV & V listed species of the EU Habitats Directive and the Flora Protection Order 2015) within the 10km squares (W77) of the study area. The results of this search are presented in Table 5.2 below.

A total of three rare and protected plant species have been reported from the 10km square (W77) in which the development site occurs. Taking into consideration the characteristics of the development site it is considered unlikely that any rare or threatened species occur within the site.

Table 5.2: Rare and protected plants recorded within the 10km grid square (W77) within which the proposed development occurs.

Common Name	Scientific Name	Date of Record	Conservation Status	Likelihood of occurrence on site.
Chives	*Allium schoenoprasum*	May 2012	FPO	Unlikely, this species is known to occur along rocky shores, stony seashores, and hillside meadows. Wild chives are also likely to occur within damp meadows and occasionally in broadleaved forests.
Little Robin Cranesbill	*Geranium purpureum*	June 2016	Vulnerable*	Unlikely, this species occurs along rocky, stony places near the sea, sheltered cliffs, disused railway lines and shingle beaches.
Meadow Barley	*Hordeum secalinum*	1984	FPO; Vulnerable*	Unlikely, Meadow Barley occurs on heavy alluvial soils associated with pastures, meadows, and roadsides in proximity to large watercourses. In coastal areas it is abundant in marsh grasslands and on earthen sea walls.

*Irish Red Data Book.

Evaluation: Considering the type of habitats that occur within the development site, it is highly unlikely that the site supports rare or threatened plant species.

5.7.4 Invasive Alien Species

No high impact invasive species were recorded during the field survey at the proposed development site. Small patches of butterfly bush (Buddleja davidii) were recorded on recolonising bare ground habitat within the eastern sections of the proposed development site. Butterfly bush is classified as a medium risk invasive species; however, the impact of the species on nature conservation remains uncertain due to lack of data showing impacts on biodiversity.

The spread and introduction of invasive species and noxious weeds will be avoided by adopting appropriate mitigation measures as per guidance issued by the NRA (2010). Any invasive species found to occur at the construction site will require a specialist method statement for its eradication to avoid the spread of invasive species; this will ensure compliance with the European Communities (Birds and Natural Habitats) Regulations 2011 [S.I. No. 477 of 2011].

5.7.5 Birds

Desktop review

A desktop review of species distribution based on winter and summer atlas records (Balmer *et al*. 2013) for the 10km square (W77) that the proposed development site is situated within was undertaken. BirdWatch Ireland and the RSPB Northern Ireland have agreed a red list of priority bird species for conservation action on the island of Ireland (Colhoun and Cummins 2013). An assessment of whether species of conservation concern are likely to occur within or interact with the proposed development site was carried out taking into consideration the habitat preferences of individual species and those habitats present within and surrounding the site. Based on the outcome of the above review and the characteristics of the proposed development site, no species of high conservation concern are likely to occur within the proposed development site.

Potential interaction of waterbird species of the Cork Harbour SPA is summarised in the following paragraphs.

Large numbers of water birds are known to occur within the Great Island Channel to the south and south-east of the proposed development. The channel forms part of the Cork Harbour SPA. Site Specific Conservation Objectives (SSCOs) for the SPA have been published by NPWS (2014) together with supporting documentation which presents detailed abundance and distribution data relating to water bird species originating from a waterbird survey programme undertaken in 2010/11 winter season. These documents have been reviewed below in an attempt to determine any possible interaction between Special Conservation Interests (SCI)s for the SPA and the proposed development site.

For the purpose of the waterbird survey programme 2010-11, the wintering bird site was divided up into a series of sub-sites (21 in total). The nearest sub-sites to the proposed development site are; Carrigrenan Pools (Site code: 0L041) approximately 0.6km south, Marino Pt to Carrigrenan Point (Site code: 0L511) approximately 1km south, Harpers Island (Site Code: 0L480), and Harper's Island South, ca 1km to the north-east.

An assessment of their likely interaction with the proposed development is presented in Table 5.3 below taking into consideration their habitat preferences and local ecological and topographical characteristics of the proposed solar waste transfer and recycling facility.

The species recorded within the sub-sites in proximity to the proposed development site are presented in Table 5.3 below. Data presented in the table has been attained from the supporting documents to the detailed conservation objectives for the site. Site information for sub-sites Carrigrenan Ponds (Site code: 0L041), Marino Pt to Carrigrenan Point (Site Code: 0L511), and Harper's Island South (0L593) are presented in Table 5.3. No records for Sub-sites 0L480 (Harpers Island), or 0L584 (Courtstown) have been recorded within the SPA supporting documents.

Table 5.3: Behaviour of birds of conservation concern recorded within the sub-sites in proximity to the proposed developments site.

Species	0L041	0L511	0L593
Teal	Roosting	Roosting	Roosting
Shoveler	Roosting		
Grey Heron		Roosting	Foraging; Roosting
Lapwing	Foraging; Roosting		
Black-tailed Godwit	Foraging;	Foraging	
Curlew	Foraging	Foraging; Roosting	Foraging; Roosting
Redshank	Foraging	Foraging	Foraging; Roosting
Black-headed Gull		Foraging; Roosting	Foraging; Roosting
Wigeon	Roosting	Foraging	Roosting
Dunlin		Foraging	
Shelduck		Foraging	Foraging
Little Grebe		Foraging; Roosting	Foraging
Red-breasted Merganser		Foraging; Roosting	Foraging; Roosting
Lesser black-backed Gull		Foraging; Roosting	Foraging; Roosting
Great Crested Grebe		Foraging; Roosting	Foraging
Cormorant		Foraging; Roosting	Foraging; Roosting
Oystercatcher		Foraging; Roosting	Foraging; Roosting
Grey Plover		Foraging	
Bar-tailed Godwit			Foraging
Common Gull		Roosting	

Field survey

Bird species recorded during site visits are listed in Table 5.4 below. The abundance of birds recorded during the visits to the site was relatively low. As outlined above most of the site comprises dry meadows and grassy verges, and recolonising bare ground, these habitats are typically of low value to bird species.

Table 5.4: Bird species recorded onsite. Peak counts and conservation status are presented.

Common Name	Latin Name	BoCCI / Annex I	Peak number recorded over two winter visits
Blackbird	*Turdus merula*	Green	2
Blue Tit	*Parus caeruleus*	Green	2
Buzzard	*Buteo buteo*	Green	1
Chaffinch	*Fringilla coelebs*	Green	3
Coal Tit	*Parus ater*	Green	1
Goldfinch	*Carduelis carduelis*	Green	4
Hooded Crow	*Corvus cornix*	Green	1
Jackdaw	*Corvus monedula*	Green	1
Magpie	*Pica pica*	Green	2
Robin	*Erithacus rubecula*	Amber	2
Rook	*Corvus frugilegus*	Green	14
Starling	*Sturnus vulgaris*	Amber	1
Wood Pigeon	*Columba palumbus*	Green	3
Wren	*Troglodytes troglodytes*	Green	2

In conclusion, based on the habitats present within the site and the known distribution and habitat preferences of birds of conservation concern in the area it is considered that further site specific bird surveys are not required.

Evaluation: Mixed broadleaved woodland immediately to the west of the proposed development site is likely to provide breeding sites for common bird species. The Great Island Channel which forms part of the Cork Harbour SPA ca 0.4km south of the site is of international importance as outlined above. An assessment of the likely interaction of the Special Conservation Interests (SCIs) of the SPA with the proposed development site is presented in the AA Screening Report, **Appendix 5.2 of the EIAR**. In summary, the birds that occur within the SPA are highly unlikely to occur within or in close proximity to the development site due to the absence of suitable habitat.

5.7.6 Mammals

Table 5.5 below lists those mammal species that have been reported from the 10km grid square (W77) of the proposed development site based on records held by the National Biodiversity Data Centre (NBDC) and the National Parks and Wildlife Service (NPWS). These species potentially occur within suitable habitat in the vicinity of the development site.

Evidence of rabbit activity was recorded within the grassland areas of the site and a number of burrows are present around the site perimeter. There was no further evidence of mammals recorded within the site during the walkover surveys.

Foxes and hares are likely to utilise areas surrounding the site. The mixed broadleaved woodland within the adjacent disused golf course may potentially provide suitable habitat for protected mammals such as badger. No evidence of badger was recorded within the site or along the site perimeter.

The mixed broadleaved woodland adjacent to the proposed development site may also provide suitable commuting and foraging habitat for bats.

The modern buildings that occur to the east and south of the proposed development offer limited potential for bat use as they are mainly metal and glass structures that are not favourable to bats. No potential bat roosts were identified within the proposed development.

Table 5.5: Mammal species of conservation concern previously reported from the 10km grid square (W77) of the study area. Source: NPWS (2017), and the NBDC (2017).

Species	Latin Name	Potentially Suitable Habitat Present	Protected Status
American Mink	*Mustela vison*	Unlikely, mink are associated with watercourse and open water. Likely to occur along the channel ca 0.4km south of the proposed development.	High Impact Invasive Species
Badger	*Meles meles*	Possible, suitable habitat occurs along the site perimeter. No evidence of badger activity recorded within the site.	Wildlife Act 1976 (as amended)
Bank Vole	*Myodes glareolus*	Unlikely, bank voles are associated with watercourses, no suitable habitat occurs within the proposed development site.	Medium Impact Invasive Species
Brown Long-eared Bat	*Plecotus auritus*	Possible, mixed broadleaved woodland occurring immediately west of the site provides suitable roosting / foraging habitat.	Annex IV EU Habitats Directive; Wildlife Act 1976 (as amended)
Brown Rat	*Rattus norvegcius*	Likely, associated with human sites, with nesting opportunities occurring throughout the site.	High Impact Invasive Species
Daubenton's Bat	*Myotis daubentonii*	Potentially, though most likely to be associated with watercourses and open water. Generally avoids urban areas, artificial lighting may potentially deter this species.	Annex IV EU Habitats Directive; Wildlife Act 1976 (as amended)
European Rabbit	*Oryctolagus cuniculus*	Confirmed, an abundance of rabbit droppings were recorded within the site. Numerous active burrows were recorded along the east, north, and western site boundary.	Medium Impact Invasive Species
Fallow Deer	*Dama dama*	Possible, although the majority of the site is fenced, open areas from the disused golf course may potentially enable access for foraging fallow deer.	High Impact Invasive Species
Feral Ferret	*Mustela furo*	Possible, this species utilises a wide variety of habitat types.	High Impact Invasive Species
Greater White-toothed Shrew	*Crocidura russula*	Possible, shrews utilise a wide variety of habitat types.	Medium Impact Invasive Species
House Mouse	*Mus musculus*	Likely, house mice are commonly associated with a wide range of urban habitats.	High Impact Invasive Species
Irish Hare	Lepus timidus subsp. hibernicus	Likely, hare are commonly associated with a wide range of sub-urban and rural habitat types.	Wildlife Act 1976 (as amended)
Irish Stoat	*Mustela erminea subsp. hibernica*	Possible, stoat utilise a wide variety of habitat types, including those that occur within the proposed development site.	Wildlife Act 1976 (as amended)

Species	Latin Name	Potentially Suitable Habitat Present	Protected Status
Lesser Noctule Bat	*Nyctalus leisleri*	Possible, may potentially utilise the hedgerows and treeline along the site's perimeter for foraging / commuting.	Annex IV EU Habitats Directive; Wildlife Act 1976 (as amended)
Natterer's Bat	*Myotis nattereri*	Possible, may potentially utilise the hedgerows and treeline along the site's perimeter for foraging / commuting.	Annex IV EU Habitats Directive; Wildlife Act 1976 (as amended)
Otter	*Lutra lutra*	Unlikely, otters are typically associated with watercourses and open water. No evidence of otter was recorded within the site.	Annex II & Annex IV EU Habitats Directive; Wildlife Act 1976 (as amended)
Pipistrelle	*Pipistrellus pipistrellus sensu lato*	Likely, Pipistrelles are the most commonly occurring bat species in Ireland and are associated with a wide range of habitat types. Hedgerows and treeline along the site's perimeter provide suitable foraging / commuting habitat for bat species.	Annex IV EU Habitats Directive; Wildlife Act 1976 (as amended)
Pygmy Shrew	*Sorex minutus*	Possible, shrews utilise a wide variety of habitat types.	Wildlife Act 1976 (as amended)
Red Fox	*Vulpes vulpes*	Likely, though no evidence of fox activity was recorded within the site.	None
Red Squirrel	*Sciurus vulgaris*	Unlikely, no suitable habitat occurs within the proposed development site. May potentially occur within woodland adjacent to the site.	Wildlife Act 1976 (as amended)
Sika Deer	*Cervus nippon*	Possible, although the majority of the site is fenced, open areas from the disused golf course may potentially enable access for foraging sika deer.	High Impact Invasive Species
Soprano Pipistrelle	*Pipistrellus pygmaeus*	Likely, the most common bat species in Ireland utilises a wide variety of habitat types.	Annex IV EU Habitats Directive; Wildlife Act 1976 (as amended)
West European Hedgehog	Erinaceus europaeus	Likely, suitable habitat occurs within the proposed development site.	Wildlife Act 1976 (as amended)
Wood Mouse	*Apodemus sylvaticus*	Possible, although most commonly associated with woodland habitats, wood mouse are highly adaptable and utilise a wide range of habitat types.	Wildlife Act 1976 (as amended)

Evaluation: The habitats present onsite are of low value to terrestrial mammal species. No protected mammal species were recorded within the site. Bats are likely to forage along hedgerow and treeline habitats along the site perimeter, and the adjacent woodland habitat to the west of the proposed development site.

5.8 Results of the Assessment (Evaluation of receiving environment)

5.8.1 Designated Sites

Two European sites occur within close proximity to the proposed development. Both designated sites are removed from the footprint of the proposed development and there are no direct pathways (such as watercourses) for pollutants between the development site and either designated site.

Other designated sites that occur within 5km of the development as described above are sufficiently removed and ecologically isolated from the development that potential impacts are not foreseen and therefore these sites are not considered further in this report.

5.8.2 Habitats and Flora

The habitats within the proposed development site are considered to be of low ecological value. Those habitats considered to be of high local importance (hedgerows, and treeline) will be retained throughout the lifetime of the project.

No plant species of conservation concern are likely to occur in proximity to the proposed development. The medium impact invasive species butterfly bush occurs within recolonising bare ground habitat within the eastern sections of the site.

There is an absence of aquatic habitats within the site.

5.8.3 Fauna

Rabbits were the only mammal species recorded within the proposed development site, though fox and hare are also likely to utilise those habitats that occur on site. Hedgerows and treeline habitat along the north and western site boundaries may potentially provide suitable foraging / commuting habitat for bat species.

Common bird species were recorded in low numbers during each site visit. It is considered that the habitats within the proposed development do not provide suitable habitat for those species listed as Special Conservation Interests for the Cork Harbour SPA.

5.9 Assessment of Impacts (Construction and operational)

5.9.1 Potential impacts

The following ecological receptors that would be sensitive to impacts from the proposed development have been identified:

- Designated sites in the surroundings;
- Habitats within the footprint of the proposed development, and
- Bird and mammal activity.

Based on the details of the proposed development the following activities may potentially give rise to impacts on ecological receptors during the construction and operational phases.

Construction Phase

- Direct habitat loss and disturbance due to land clearance and construction of site infrastructure;
- Noise, vibration, and artificial lighting may potentially give rise to displacement / disturbance impacts, and
- Increased site access (Lorries, plant, etc.) may give rise to disturbance impacts on resident fauna.

Operational Phase

- Noise and vibration from the new facility may potentially lead to disturbance impacts on resident fauna. Operation of the plant will be needed to occur over 24 hours;
- Artificial lighting may give rise to disturbance impacts on resident fauna (including avifauna), and
- Increased traffic associated with the operation of the waste facility may potentially give rise to disturbance impacts on resident fauna.

Potential impacts on key ecological receptors are assessed in the following sections.

Designated sites

Reference should be made to the Appropriate Assessment Screening Report, **Appendix 5.2** of the EIAR, which sets out the likelihood and significance of any potential impacts on European designated sites.

Great Island Channel cSAC

Table 5.6 below presents an assessment of potential impacts on the qualifying features for the Great Island Channel cSAC. In summary, no potential adverse impacts due to the proposed development on the qualifying interests of the cSAC are foreseen.

Table 5.6: Qualifying interests of the Great Island Channel cSAC and the likelihood of significant impacts.

Name	Potential Impacts
Estuaries	This habitat type occurs approximately 0.4km south-east of the proposed development at its nearest point. There are no direct linkages between the proposed development site and this habitat type. Considering the nature and scale of the proposed development and the absence of potential connectivity between the development site and the cSAC, significant adverse impacts on this habitat are not foreseen.
Tidal mudflats and sandflats	This habitat type occurs approximately 0.4km east of the proposed development at its nearest point. The habitat is well removed from the footprint of the proposed development. There are no direct pathways between the proposed development site and this habitat type. Considering the nature and scale of the proposed development, and the absence of potential linkages between the site and tidal mudflats and sandflats, adverse impacts on this habitat type are not foreseen.

Cork Harbour SPA

The Cork Harbour SPA occurs approximately 0.4km south-east of the proposed development at its nearest point. The likely occurrence of the SCIs of the Cork Harbour SPA occurring within the site is presented in Table 5.7. The habitats within and adjoining the proposed development site are unlikely to support bird species of conservation concern. Considering the current land-use in the sites surroundings, it is deemed that qualifying interests associated with the SPA do not utilise the proposed development site and adjoining habitats.

In summary, considering the scale and extent of the development together with the absence of suitable habitat within the site no potential adverse impacts on the SCIs of the SPA are foreseen.

Table 5.7: Special Conservation Interests (SCIs) of the Cork Harbour SPA and the likelihood of occurrence within the proposed development site.

Species of Conservation Concern	Conservation Status	Likely occurrence on site
Little Grebe	Amber	Not likely to occur within the proposed development site as grebe species are confined to wetland habitats.
Great Crested Grebe	Amber	
Cormorant	Amber	Not likely to occur or rely on those habitats that occur within the proposed development site. Cormorant are associated with watercourses and open water habitats.
Grey Heron	Green	Not likely to occur or rely on those habitats that occur within the proposed development site. Grey Heron are associated with water courses and other wetland habitats.
Shelduck	Amber	Shelduck are largely confined to wetland habitats and are unlikely to occur within the proposed development site.
Wigeon	Red	These species are largely confined to wetland habitats and are unlikely to occur within the proposed development site. Suitable habitat occurs along the Great Island Channel ca 0.4km south of the proposed development site.
Teal	Amber	
Pintail	Red	
Shoveler	Red	
Red-breasted Merganser	Green	
Oystercatcher	Amber	Confined to shingle shores, dunes, and saltmarshes. No suitable habitat occurs within the proposed development site.
Golden Plover	Annex I; Red	Known to flock inland during the winter months. The grassland within the proposed development site is considered unsuitable to support this Annex I species.
Grey Plover	Amber	An exclusively coastal species, likely to be confined to more suitable habitats to the south of the proposed development site.
Lapwing	Red	The disturbed grassland within the proposed development site does not provide suitable foraging habitat for lapwing.
Dunlin	Annex I; Red	The habitats within the proposed development site are considered to be unsuitable for dunlin, confined

Species of Conservation Concern	Conservation Status	Likely occurrence on site
		to mudflats and sandflats in the winter and grasslands in proximity to open water in summer months.
Black-tailed Godwit	Amber	No suitable habitat for foraging or breeding godwit occurs within the proposed development site.
Bar-tailed Godwit	Amber	No suitable habitat for foraging or breeding godwit occurs within the proposed development site.
Curlew	Red	The disturbed ground within the proposed development is considered to be of low value to Curlew.
Redshank	Red	No suitable habitat for Redshank occurs within the site and therefore the site is considered to be of low value to this species, likely to be confined to estuarine and tidal mudflat habitats south of the site.
Black-headed Gull	Red	Unlikely, black-headed gull are associated with wetlands and coastal habitats.
Common Gull	Amber	Unlikely, associated with coastal habitats such as islands, cliffs, and shingle banks.
Lesser Black-backed Gull	Amber	Unlikely, the habitats within the site are considered unsuitable for foraging gulls.
Common Tern	Annex I; Amber	Unlikely, this summer visitor is associated with coastal habitats, no suitable habitat occurs within the proposed development site.

5.9.2 Habitat Loss

The footprint of the development will cause a direct loss of habitat where the new waste transfer and recycling facility and associated infrastructure are to be developed. Areas outside the footprint of the development will not suffer direct habitat loss. The loss of habitat as a result of the proposed development may impact on birds and mammals that utilise the affected habitats by reducing availability of habitat at the local scale.

All of the habitat loss is restricted to habitats of low value (GS2 dry meadows and grassy verges, and ED3 recolonising bare ground). The proposed development will not result in the loss of any habitat of conservation significance.

The loss of low value habitat is deemed to be an imperceptible negative impact. There will be no direct impacts on semi-natural habitats. Those habitats directly affected by habitat loss are summarised in Table 5.8.

Table 5.8: Direct habitat loss associated with the proposed development.

Habitat Type	Ecological Value	Extent of Habitat Loss
Dry meadows and grassy verges (GS2)	Local importance, lower value.	The majority of the site comprises this habitat type. The footprint of the proposed development may potentially lead to the loss of ca 1.1ha of this habitat type.
Recolonising bare ground (ED3)	Low value	Eastern sections of the site will lead to the loss of this habitat type, equating to approximately 0.3ha

5.9.3 Disturbance and Displacement of Fauna

The loss of habitat as outlined above may cause the local displacement of common bird and mammal species from the site. The displacement of rabbits (a medium impact invasive species) from the site due to loss of habitat is likely to have an imperceptible adverse impact on the local population. Rabbits are a common and widespread species of no conservation concern.

There is an absence of suitable bat breeding sites within proximity to the waste transfer and recycling facility site.

Construction noise and increased human activity (including heavy vehicular access) are likely to result in the temporary displacement of birds and mammals from the immediate surroundings. This is considered a short-term imperceptible negative impact due to the high background levels of disturbance from the existing industrial development in the area and the absence of species of conservation concern from the area around the proposed waste transfer and recycling facility development.

The site is already subject to light pollution from adjacent warehouses, and from noise and vibration from heavy vehicle activity in proximity to the site (to the east and south). The increased activity during the operational phase is likely to give rise to some minor impacts on bats and other mammal usage of the area. This impact is deemed to be imperceptible.

During operational phase, the site is likely to be less suitable as foraging habitat for common bird species. It is expected that birds and mammals will continue to utilise those parts of the site that will retain suitable habitats (hedgerows, treeline, woodland).

5.9.4 Indirect Impacts

Habitat fragmentation

Based on the extent, distribution and conservation value of habitats within the site, habitat fragmentation effects are not foreseen. Hedgerows and treeline that occur along the perimeter of the site will be retained during the duration of the proposed development.

Changes in habitat management

The site is currently unmanaged, occurring within a ‘greenfield’ (undeveloped) site. The site is bound by a disused golf course to the west, an industrial estate (warehouses) to the east and south, and arable crops to the north. The site is currently considered to be of low value to protected mammals and birds of conservation concern. The change of land use within the site is therefore unlikely to lead to significant impacts on terrestrial ecology within and surrounding the site.

Hydrological impacts

Hydrological impacts to habitats could result from changes to patterns of surface water and / or groundwater drainage. There are no natural watercourses within or in close proximity to the proposed development site. Hydrological impacts are presented in Chapter 7 below.

Impacts on downstream (aquatic) habitats and species

Sources of impacts on aquatic species and habitats downstream would include any deterioration of water quality due to either silt or sediment run-off or accidental spillages of hydrocarbons (fuels) and other possible contaminants used during the construction phase of the development. The Great Island Channel cSAC that occurs ca 0.4km south-east of the proposed development site is not designated for any Annex II aquatic species, however tidal mudflats (EU Habitat Code: 1140), and Atlantic salt meadows (EU Habitat Code: 1330) would be susceptible to pollution impacts. There are no hydrological pathways to the cSAC and therefore pollution impacts on these Annex I habitats are not foreseen.

Habitats within the Great Island Channel ca 0.4km south of the proposed development site provide suitable habitat for otter, a species listed on Annex II of the EU habitats Directive, and protected under the Wildlife Act 1976 (as amended). Considering the land-use that occurs between the proposed development site and its isolation (no hydrological impacts) from the channel, potential adverse impacts on otter are not foreseen.
Based on the low levels of additional surface water runoff as a result of the proposed development and the capacity of the proposed surface water drainage system discussed in Chapter 7 below and within the Construction Environmental Management Plan (CEMP) provided in **Appendix 6.3, EIAR Volume II**, all surface run-off from the proposed development will be collected and adequately treated prior to discharge to the existing storm and sewer network, with no discharges to watercourses proposed (see Chapter 7 below for further details) and therefore no impacts on downstream watercourses and associated flora & fauna are foreseen.

Rain water will be collected and used for truck washing and as toilet water. All other surface draining water will pass through a Bypass Separator along with all other surface drainage at the site and will flow into the sewer via a 225mm PVC storm pipe. Foul drainage will be discharged into the existing foul drain at the site (located at the entrance of the development). All waste water will be discharged to the sewer and foul drain pipe and no discharges to surface waters will occur at the site. The existing water infrastructure and drains at the site are sufficient to service the proposed development. All non-process paved and roofed areas will be drained according to sustainable drainage system (SUDS) principles

No other adverse impacts during the operational phase have been identified.

5.9.5 Other species

No other faunal species were recorded within the proposed development site. Due to the absence of natural or artificial watercourse the site is unlikely to be of value to amphibians or aquatic species.

5.9.6 Invasive Alien Species

No high impact invasive alien species were recorded within the proposed development site. Sparse stands of butterfly bush (*Buddleja davidii*) (a medium impact invasive species) occur within the eastern sections of the site on recolonising bare ground. The spread and introduction of invasive species and noxious weeds will be avoided by adopting appropriate mitigation measures as per guidance issued by the NRA (2010). Any invasive species found to occur will require a specialist method statement for its eradication to avoid the spread of invasive species; this will ensure compliance with the European Communities (Birds and Natural Habitats) Regulations 2011 [S.I. No. 477 of 2011].

5.10 Mitigation

As identified above, the proposed development occurs within disused agricultural land that is of low value to any species of conservation concern. Potential impacts associated with the development are minor and not significant. The following measures have been incorporated into the design of the project to minimise ecological impacts.

5.10.1 Construction Phase

Construction methodology will follow best industry practice and will incorporate and adhere to the following measures and controls which are included in the detailed Construction Environmental Management Plan (CEMP), provided in **Appendix 6.3** of this EIAR:

- Works will be carried out in accordance with best industry practice.
- The field boundaries are to be retained with all works set back from these boundaries with development buffer zones implemented with harris fencing to protect existing vegetation and a drainage ditch as shown on **Drawing 1022** and **1026, EIAR Volume III.**
- Where feasible, any woody vegetation clearance will take place outside the bird breeding season (March to August, inclusive).
- If it is required that woody vegetation be removed during the bird breeding season, the area will be checked in advance by an ecologist to ensure that nesting birds will not be disturbed.
- All construction related activity will be confined to the foot-print of the proposed development and adjacent road surfaces.
- The use of artificial lighting during the construction phase will be minimised to reduce any potential effect on bats.
- Where soil excavations are required, topsoil and subsoil will be stored separately to minimise soil damage.
- The construction compound is located in a suitable area, removed from sensitive habitats (hedgerows and treelines).
- A surface water drainage plan provided within the outline CEMP will be implemented to ensure no impacts on surrounding or downstream watercourses during construction or operation.
- The spread and introduction of invasive species and noxious weeds will be avoided by adopting appropriate mitigation measures as per guidance issued by the NRA (2010).

5.10.2 Operational Phase

The following measures are proposed in order minimise potential adverse impacts associated with the operational phase:

- To minimise any potential impact on the use of the area by bat species the use of artificial lighting will comply with appropriate guidelines for bat friendly lighting (Bat Conservation Ireland 2010).
- Rainwater will be collected onsite and used in onsite truck washing and as toilet water. All other surface draining water will pass through a hydrocarbon interceptor along with all other surface drainage at the site and will flow into the sewer.
- Foul drainage will be discharged into the existing 150mm diameter foul drain at the site located at the entrance of the development.
- All waste water will be discharged to the sewer and foul drain pipe and no discharges to surface waters will occur at the site. As outlined Chapter 7 below, the existing water infrastructure and drains at the site are sufficient to service the proposed development.

5.11 Residual Impacts

Considering the nature of the project together with the type and extent of habitat that will be affected it is predicted that, subject to the above mitigation being implemented, there will be no significant adverse direct, indirect, or cumulative impacts on the flora and fauna of the site and its surroundings from the development of the proposed project. The site occurs within an industrial estate, with existing warehouses occurring to the east and south of the proposed development.

The development of a waste transfer and recycling facility at the site will result in the permanent loss of dry meadows and grassy verges, recolonising bare ground. Based on the low value of these habitats to species of conservation concern this impact is deemed to be imperceptible. Additional noise and activity in the area may potentially lead to disturbance impacts on resident mammal (including bats) species. Considering the nature of the surrounding environment, this disturbance impact is considered to be a long-term imperceptible impact.

5.12 References

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6 Chapter 6 – Land (Soils, Geology and Hydrogeology)

6.1 Introduction

The impact of the proposed development of a warehouse facility operating as a recycling and waste transfer facility with respect to land, soils, geology and hydrogeology will be assessed in this section. A discussion on the need for the proposed development and the regional and local planning designations and policies relevant to the Little Island site are also provided within this chapter.

6.1.1 Competent Expertise

OES Consulting were commissioned to undertake an assessment of the potential impacts associated with the activities and proposed developments previously outlined, on the land, soils geological and hydrogeological characteristics of the site and surrounding environs. The assessment was led by Daniel Hayden who received an Honours BSc degree in Environmental Science from University College Dublin (UCD) and an MSc in Environmental Engineering from Trinity College Dublin (TCD). Daniel is experienced in undertaking environmental impact assessment and the preparation of EIA reports particularly in the areas of geology, hydrology and hydrogeology. Throughout his career Daniel has successfully completed numerous EIARs across a range of industries including the dairy sector, pharmaceutical and chemical manufacturing and high-tech industries.

6.1.2 Study Assessment and Methodology

A desk based study of the proposed development areas was conducted which involved reviewing available geotechnical information held by the Geological Survey of Ireland (GSI) on the site and surrounding lands.

The following sources were reviewed:

- Met Éireann Meteorological Database (www.met.ie).
- Geological Survey of Ireland (GSI) public mapping system website (www.gsi.ie).
- Irish Soils Information System (www.gis.teagasc.ie/isis/map.php).
- Water Framework Directive - WaterMaps Map Viewer (www.wfdireland.ie).
- Environmental Protection Agency (EPA) Envision public viewer (www.epa.ie)
- EPA Hydrotool Report – Cummer River - Attachment 2 (http://watermaps.wfdireland.ie/HydroTool))
- Department of Environment, Community & Local Government (www.myplan.ie/viewer).
- CFRAM Preliminary Flood Risk Assessment Mapping (www.cfram.ie).
- National Parks and Wildlife Services Map viewer (www.npws.ie)
- Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes by the National Roads Authority (NRA, 2009).

A detailed site walkover survey was also completed in January 2017 to inform the assessment and ground truth the information gathered in the desk top assessment.

In assessing the importance and sensitivity of the existing environment with respect to soils, geology and hydrogeology within and surrounding the proposed development site reference is also made to the National Roads Authority (NRA) criteria for rating site attributes, as presented in Table 6.1 and Table 6.2 below.

Table 6.1 Criteria for Rating Site Attributes – Estimation of Importance of Soil and Geology Attributes (National Roads Authority, 2009)

Importance	Criteria	Typical Example
Very High	Attribute has a high quality or value on a regional or national scale. Degree or extent of soil contamination is significant on a national or regional scale. Volume of peat and/or soft organic soil underlying route is significant on a national or regional scale*	➢ Geological feature rare on a regional or national (NHA) ➢ Large existing quarry or pit ➢ Proven economically extractable mineral resource
High	Attribute has a high quality or value on a local scale Degree or extent of soil contamination is significant on a local scale. Volume of peat and/or soft organic soil underlying route is significant on a local scale*	➢ Contaminated soil on site with previous heavy industrial usage. ➢ Large recent landfill site for mixed wastes. ➢ ecological feature of high value on a local scale (County Geological Site) ➢ Moderately sized existing quarry or pit. ➢ Marginally economic extractable mineral resource
Medium	Attribute has a medium quality or value on a local scale	➢ Contaminated soil on site with previous light industrial usage ➢ Small recent landfill site for mixed wastes ➢ Moderately drained and/or moderate fertility soils ➢ Small existing quarry or pit ➢ Sub-economic extractable mineral
Low	Attribute has a low quality or value on a local scale	➢ Large historical and/or recent site for construction and demolition wastes ➢ Small historical and/or recent landfill site for construction and demolition wastes ➢ Poorly drained and/or low fertility soils ➢ Uneconomically extractable mineral resource

Table 6.2 Criteria for Rating Site Attributes – Estimation of Importance of Hydrogeology Attributes (National Roads Authority, 2009)

Importance	Criteria	Typical Example
Extremely High	Attribute has a high quality or value on an international scale	Groundwater supports river, wetland or surface water body ecosystem protected by EU legislation e.g. SAC or SPA status
Very High	Attribute has a high quality or value on a regional or national scale.	Regionally importance aquifer with multiple wetlands Groundwater supports riverm wetland or surface water body ecosysytem protected by national legislation – NHA status
High	Attribute has a high quality or value on a local scale	Regionally Important Aquifer Groundwater provides large proportion of baseflow to local rivers

		Locally important potable water source supplying > 1000 homes Outer source protection area for regionally important water source Inner source protection area for locally important water source
Medium	Attribute has a medium quality or value on a local scale	Locally important aquifer Potable water source supplying >50 homes Outer source protection area for locally important water source
Low	Attribute has a low quality or value on a local scale	Poor bedrock aquifer Potable water source supplying <50 homes

In conjunction with the EPA impact assessment methodology and criteria as outlined in Chapter 2 above reference is also made to the NRA criteria (NRA, 2009) regarding impacts on the existing soil, geology and hydrogeological environment. These criteria are outline in Table 6.3 and Table 6.4 below.

Table 6.3 Criteria for Rating Site Attributes – Estimation of Magnitude of Impact on Soil/Geology Attribute

Magnitude of Impact	Criteria	Typical Example
Large Adverse	Results in loss of attribute	➢ Loss of high proportion of future quarry or pit reserves ➢ Irreversible loss of high proportion of local high fertility soils ➢ Removal of entirety of geological heritage feature ➢ Requirement to excavate / remediate entire waste site ➢ Requirement to excavate and replace high proportion of peat, organic soils and/
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	➢ Loss of moderate proportion of future quarry or pit reserves ➢ Removal of part of geological heritage feature ➢ Irreversible loss of moderate proportion of local high fertility soils ➢ Requirement to excavate / remediate significant proportion of waste site ➢ Requirement to excavate and replace moderate proportion of peat, organic soils and/or soft mineral soils beneath alignment
Small Adverse	Results in minor impact on integrity of attribute of loss of small part of attribute	➢ Loss of small proportion of future quarry or pit reserves ➢ Removal of small part of geological heritage feature ➢ Irreversible loss of small proportion of local high fertility soils and/or high proportion of local low fertility soils ➢ Requirement to excavate / remediate small proportion of waste site ➢ Requirement to excavate and replace small proportion of peat, organic soils and/or soft mineral soils beneath alignment
Negligible	Results in an impact on attribute but not of sufficient magnitude to affect either use or integrity	➢ No measurable changes in attributes

Minor Beneficial	Results in minor improvement of attribute quality	➢ Minor enhancement of geological heritage feature
Moderate Beneficial	Results in moderate improvement of attribute quality	➢ Moderate enhancement of geological heritage feature
Major Beneficial	Results in major improvement of attribute quality	➢ Major enhancement of geological heritage feature

Table 6.4 Criteria for Rating Impact Significance - Estimation of Magnitude of Impact of Hydrogeology

Magnitude of Impact	Criteria	Typical Example
Large Adverse	Results in loss of attribute	➢ Removal of large proportion of aquifer ➢ Changes to aquifer or unsaturated zone resulting in extensive change to existing water supply springs and wells or ecosystems ➢ Potential high risk of pollution to groundwater from routine 'run-off' ➢ Calculated risk of serious pollution incident >2% annually
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	➢ Removal of moderate proportion of aquifer ➢ Changes to aquifer or unsaturated zone resulting in moderate change to existing springs and wells, river baseflow or ecosystems ➢ Potential medium risk of pollution to groundwater from routine run-off ➢ Calculated risk of serious pollution incident >1% annually
Small Adverse	Results in minor impact on integrity of attribute of loss of small part of attribute	➢ Removal of small proportion of aquifer ➢ Changes to aquifer or unsaturated zone resulting in minor change to water supply spring and wells, river baseflow or ecosystems ➢ Potential low risk of pollution to groundwater from routine run-off ➢ Calculated risk of serious pollution incident >0.5% annually
Negligible	Results in an impact on attribute but not of sufficient magnitude to affect either use or integrity	➢ Calculated risk of serious pollution incident <0.5% annually

6.2 Baseline Description of Existing Conditions

The receiving environment is sub-divided into relevant sections concerning geology, soils, hydrogeology and land as the characteristics, though linked, have different risks from the development.

6.2.1 Topography and Climate

The proposed green-field site is located within an established commercial industrial estate and is bounded by the now closed Harbour Point Golf Club to the west, an agricultural field to the north and number of commercial properties to the east and south. The topography of Harbour Point Business

Park is described as relatively low-lying at an elevation of between 15m – 20m AOD with the topographic gradient rising to 29m AOD along the western boundary of the site.

The proposed facility is located within the catchment of the River Lee, which rises in the west Cork mountain ranges approximately 60km to the west of Cork City. The development site is located approximately 400m to the west of the Cork Harbour Special Protection Area (SPA) and the Great Island Channel Special Area of Conservation (SAC) and proposed Natural Heritage Area (pNHA).

The SAAR (Standard Average Annual Rainfall 1981 - 2010) recorded at Cork Airport (ca. 12 km south west of the Little Island site), the closest rainfall station to the site with long term SAAR data, is 1,228mm (www.met.ie). The average potential evapotranspiration (PE) at Cork Airport is taken to be 482.5mm (www.met.ie). The actual evapotranspiration (AE) is calculated to be 458mm (95% PE). Using the above figures, the effective rainfall (ER) for the area is calculated to be (ER = SAAR – AE) 770mm.

6.2.2 Geology

The Geological Survey of Ireland (GSI) has mapped the underlying bedrock as Dinantian Pure Unbedded Limestones consisting of massive and crinoidal fine limestone which forms the Little Island Formation**.** There are no mapped structural fault lines running through the site. The depth to bedrock has been found to vary from approximately 3 m depth to 10 m depth from previous investigations. The thickness of subsoils across the site also has been found to vary in response to the variation in the depth to bedrock surface.

Regional geology is illustrated in **Figure 6.1 Bedrock Geology (EIAR Volume III).**

6.2.3 Soils

The GSI classify the soils underlying the Little Island site as being predominantly deep well drained mineral (Mainly basic) (BminDW) derived mainly from calcareous parent material. They are in the great soil groups of Grey Brown Podzolics, Brown Earths (medium-high base status), see **Figure 6.2 Soils (EIAR Volume III)**. Beneath the topsoil lies naturally occurring brown subsoils comprising either very clayey sandy gravels or sandy very gravelly clays across the majority of the site.

The GSI classify the subsoil underlying the proposed development as being Limestone Till (TLs) from the Carboniferous period see **Figure 6.3 Sub-Soils (EIAR Volume III)**. The permeability of this subsoil type is typically moderate according to the GSI. A review of publicly available geotechnical/borehole historical borehole logs from the local area describe the soil profile as displaying varying overburden depths with bedrock having been encountered at depth between 0.8 to 9.6 m below ground level (bgl). The extracted geotechnical data/report is provided in **Appendix 6.1, EIAR Volume II.**

The closest borehole log (Ref No. 66256) as per **Appendix 6.1** is described as comprising clayey topsoil (0 – 0.3mbgl) followed by brown sandy clay (0.3 – 0.76mbgl) followed by shallow bedrock (0.76 – 1.52mbgl). According to the GSI, there are many areas of Little Island with subsoils of <3m where rock outcrop is common. However, as stated this information only indicative of the possible characteristics of the underlying geology within the development site area and as stated overburden depths can vary within the locality as evident in the **Appendix 6.1.**

6.2.4 Hydrogeology

The limestone bedrock within the region is classified by the Geological Survey of Ireland (GSI) as a regionally important karstified (Rkd) aquifer dominated by diffuse flow. According to the GSI, the Little Island site is underlain by undifferentiated sands and gravels, but these have not been classified as an

aquifer. Nevertheless, it is expected that these fluvio-glacial deposits are in hydraulic continuity with the bedrock aquifer providing additional storage capacity and a component of inter-granular flow above the secondary permeability (fissure / conduit flow) within the karst limestone bedrock system.

In the Impure Limestones underlying the Courtstown site, most groundwater flow occurs in an upper weathered layer of a few metres and a zone of interconnected fissures often not extending more than 15 m from the top of the bedrock. Groundwater flow is influenced by topography and most flow is of a local nature. In the gravel aquifer groundwater flow will occur in the direction of the hydraulic gradient, which is likely to be south and southwest towards the sea.

The site is located within the Midleton Groundwater Body (GWB), which has been designated and mapped as part of the Southwestern River Basin District in accordance with the Water Framework Directive (2000/60/EC). The Groundwater Body has been classified as being of "Good" chemical and overall status due to minimal pressures from industrial land-uses. The 1st Draft Midleton Groundwater Body report is provided in **Appendix 6.2, EIAR Volume II**.

This GWB has many areas of Extreme Vulnerability, particularly to the area east of Castlemartyr, around Midleton and on Little Island. In sand/gravel aquifers a water table depth of 3 metres constitutes the boundary between Extreme and High vulnerability. Aquifer classification is shown on **Figure 6.4** provided in **EIAR Volume III**. Groundwater vulnerability immediately underlying the Little Island site has been mapped as High according to the GSI and an area of thin subsoil and an area of rock outcrop near to the surface has been mapped approximately 100m to the north-east of the site, see **Figure 6.5 Aquifer Vulnerability (EIAR Volume III)**. The design and operation of the plant will reduce the potential impact of the site on the underlying ground and groundwater. The GSI groundwater vulnerability categories and mapping guidelines are shown in Table 6.5 below.

Table 6.5: GSI Groundwater Vulnerability Categories

Vulnerability Rating	Hydrogeological Conditions				
	Subsoil Permeability (Type) and Thickness			Unsaturated Zone	Karst Features
	High permeability (sand/gravel)	Moderate permeability (e.g. Sandy subsoil)	Low permeability (e.g. Clayey subsoil, clay, peat)	(Sand/gravel aquifers only)	(<30 m radius)
Extreme (E)	0 - 3.0m	0 - 3.0m	0 - 3.0m	0 - 3.0m	-
High (H)	>3.0m	3.0 - 10.0m	3.0 - 5.0m	>3.0m	N/A
Moderate (M)	N/A	>10.0m	5.0 - 10.0m	N/A	N/A
Low (L)	N/A	N/A	>10.0m	N/A	N/A

Notes: (1) N/A = not applicable.
(2) Precise permeability values cannot be given at present.
(3) Release point of contaminants is assumed to be 1-2 m below ground surface.

Groundwater recharge is a hydrological process where water moves downward from surface water to groundwater. Recharge is the primary method through which water enters an aquifer. Groundwater recharge at the proposed site has been mapped as 391 mm/yr based on average effective rainfall of 651 mm/yr over a grass land cover with an estimated 60% recharge coefficient (Geological Survey of Ireland). The extent of recharge will be dependent on the nature of surface cover and may be lower than that mapped by the GSI due to the presence of impermeable surfaces across a high proportion of the site.

The site lies within the west of the Middleton Groundwater Body (GWB) and water quality is classified as a being dominated by calcium and bicarbonate ions. Hardness can range from moderately hard to very hard (200 to >400 mg/l (as $CaCO_3$). Spring waters tend to be softer as throughput is quicker and there is less time for the dissolution of minerals into the groundwater. Groundwater alkalinity is high, up to 400 mg/l (as $CaCO_3$). Alkalinity is generally less than hardness, indicating that ion exchange (where calcium or magnesium is replaced by sodium) is not significant. These hydrochemical signatures are characteristic of clean limestone. Like hardness and alkalinity, electrical conductivities (EC) can vary greatly.

Typical limestone water conductivities are of the order of 500-700 µS/cm. Conductivities in the Cork Group rocks are quite similar with an average of 380 μS/cm and a range from 160 to 430 µS/cm. In general, high iron (Fe) and manganese (Mn) concentrations can occur in groundwater derived from ORS, due to the dissolution of Fe and Mn from the sandstone/shale where reducing conditions occur. Background chloride concentrations in the local aquifer are likely to be higher at this location than in the Midlands, due to the proximity to the sea.

6.2.5 Geological Heritage

A review of the GSI database and mapping on geological heritage sites was conducted. It has been confirmed that there are no Geological Heritage sites located within or in the immediate vicinity of the proposed development site. The nearest sites are identified as being an area of Cork Red Marble and Visean Limestone located approximately 1km south-west of the proposed development site, which was once utilised as part of Rock Farm Quarry, located along the southern shoreline of Little Island, south of Cork Golf Club. The location of these geological heritage is illustrated **Figure 6.6 Geological Heritage (EIAR Volume III).**

Table 6.6: GSI Geological Heritage

	1	2
Site Name	Rock Farm Quarry, Little Island	Little Island
Igh-Theme-Primary	IGH 8 Lower Carboniferous	IGH 3 Carboniferous - Pliocene Palaeontology
Igh-Theme-Tertiary		
Igh-Theme-Secondary	IGH 3 Carboniferous - Pliocene Palaeontology	IGH 8 Lower Carboniferous
County	Cork	Cork
Buffer Metres	200	200
Critical Features	Limestone quarries, red marble, crinoidal wackestones	Cork Red Marble
Summary Description	A series of limestone quarries in which the limestone is divided into three distinctive zones of the Visean (Lower Carboniferous). Provides the type section for the Cork Red Marble Fm on its western shore & forms the type section for the Little Island Fm.	Little Island provides the type section for the Cork Red Marble Formation
X Centroid Itm	175840	176000
Y Centroid Itm	071230	071000
Ex-Asi Site?	Cork #33	

Site Designation	CGS, may be recommended for Geological NHA	CGS, may be recommended for Geological NHA
Legal Foundation Date	2002, 2000	2002, 2000
Legal Foundation Documents	National Heritage Plan, 2002; WILDLIFE (AMENDMENT) ACT, 2000	National Heritage Plan, 2002; WILDLIFE (AMENDMENT) ACT, 2000
Site protection classification	geological	geological

6.2.6 Site Evaluation

Based on the NRA methodology outlined above, the criteria for rating site importance of soil and geology attributes, the importance of the proposed development site is rated as being Low importance. This is based on the assessment that that attribute has a low-quality significance or value on a local scale. Based on historical use of the site little to no contamination of underlying soil/geology is expected. No significant geological/extractable resources have been identified to underlie the proposed site area.

With respect to the hydrogeological attributes of the development area, based on the NRA methodology and criteria outlined above the existing environment is regarded as being Moderate importance. It is important to note that the site is not located within or in the immediate vicinity of any source protection zones, nor is it located within a significant groundwater potable supply area.

6.3 Assessment of Impacts of the Proposed Development

6.3.1 Construction Phase

The potential impacts of the proposed waste transfer development on soils and groundwater are outlined below:

- Contamination of groundwater and soils through the ingress of untreated effluent, chemicals and construction materials.
- Alteration of water table levels.

The construction phase of the waste transfer facility will involve the excavation of soils for foundation construction to provide a base for infrastructure. Construction works associated with the proposed scheme will involve typical construction activities such as excavation, filling, lifting, pumping, pipe laying, concrete works and mechanical installations.

Earth Works

Excavations will involve removal of overburden to facilitate the installation of building foundations, drainage and services, together with creating level areas for access tracks / pathways. It is expected that soil excavations for foundation construction associated with the development will be to be up to 2.5m deep in most areas of the site, with deeper excavations envisaged near the site entrance and to allow for the installation of the firewater retention tank. Temporary mounds of excavated material will be stored along the western boundary of the site as shown on **Drawing 1022,** provided in **EIAR Volume III**. A 225mm perforated land drain will be installed on both sides of the excavation mounds to collect and contain run off, which will connect into a 225mm diameter PVC Storm Pipe located within the site compound which will act as the primary site drainage mechanism and will connect to

the existing storm manhole at the site entrance. The land drains will be wrapped in theram to prevent sediments getting into the storm pipe. A Bypass Separator will be installed just inside the site entrance which will be cleaned out regularly. A detailed description of the mitigation measures to be installed during the construction stage to prevent run off and contamination of ground and surface water bodies is provided in the Construction Environmental Management Plan provided in **Appendix 6.3, EIAR Volume II**.

All materials excavated during foundation construction will be used as backfill, reinstating all roads and grass margins back to their original condition. Material will also be utilised to form an earthen embankment between the proposed facility and the natural area of trees to be planted along the western boundary, as shown on **Drawings 1001** and **1026**. Any excess materials will be disposed of to a licensed disposal facility. It is therefore considered that the proposed upgrade works will have negligible or no variation to soils, geology or hydrogeology. The majority of the warehouse development will be constructed on made ground with potential to encounter the underlying limestone bedrock.

Runoff and Drainage to surface watercourses

The subsoil has been classified as having moderate permeability and aquifer vulnerability is described as being high. There are however no surface water courses such as rivers or lakes within the site boundary or immediate surroundings which will ensure that accidental discharges or spillages during the construction phase are not likely to travel significantly beyond the development area and will not impact on the geology or hydrogeology further downstream of the site. Local surface water drainage is limited to man-made drainage ditches located along the western and north/north-eastern boundary of the proposed development site therefore there will be no direct impact on significant, sensitive surface water features. Potential impacts on surface, hydrological features are not anticipated to pose a risk to the geological and hydrogeological environment within and surrounding the site.

There are a number of proposed mitigation measures which are outlined in further detail in Chapter 7 below limiting the potential impact on hydrology further. These include proposed cut-off drains are silt fencing to mitigate the potential transportation of silt-laden or otherwise contaminated surface water run-off from the site.

Oils, Lubricants and Construction Materials

The construction and operation of the proposed development involves the use of a range of materials and fluids. These include fuels and lubricants used for construction machinery, which if spilled, have the potential to give rise to contamination of surface and ground waters. The issue of accidental spillage of hydrocarbons such as diesel and lubrication oil during refuelling of plant machinery is a potential risk during the construction phase. Mitigation measures regarding the handling of potentially environmentally hazardous substances such as oils and lubricants are outlined in Section 6.4 below.

6.3.2 Operational Phase

It is considered that the operation of the proposed development will have negligible or no variation to the hydrogeology, soils or geology of the site. The vast majority of the site in which process activities take place is located on made ground and hard standing. Site infrastructure is being designed to include sufficient site drainage to divert and control any potential spills or leaks which may otherwise enter soils or groundwater.

The proposed development will be connected to the Cork City municipal water supply and will not source water from wells or groundwater sources, leading to no such abstraction at the site. The proposed development will require the small amount of 10m^3 per day of water from the public supply, which will not add significant pressure on the quantity provided by the public water supply for either the facility or any other potential users in the vicinity.

Having assessed the environmental factors and characteristics of the site and surrounding environs it is not anticipated that the site is at risk of any natural disasters or is likely to be vulnerable to any environmental incidents following construction which would subsequently result in further incident causing any negative impact on the environment, with respect to soils and geology. Flood risk is discussed in Chapter 7 below.

6.4 Mitigation Measures

As with any civil engineering project of this nature it is vital to ensure that prior to works commencing on site, adequate mitigation measures are put in place to prevent potential environmental impacts. All such mitigation measures will be detailed within a construction stage management plan (CMS) which will be produced by the Construction Works Contractor (CWC) to describe, explain and monitor how the mitigation measures proposed in the Construction Environmental Management Plan (CEMP) provided in **Appendix 6.3 of EIAR Volume II** will be implemented on site.

The CEMP has been produced for the purpose of protecting water quality and groundwater, preventing soil run-off and to protect sensitive habitats and species.

6.4.1 Pre-emptive Site Drainage Management (Weather)

The works programme for the initial construction stage of the development will take account of weather forecasts, and predicted rainfall in particular. Large excavations and movements of subsoil or vegetation stripping will be suspended or scaled back if heavy rain is forecast. The extent to which works will be scaled back or suspended will relate directly to the amount of rainfall forecast. It is recommended to suspend works if forecasting suggests either of the following is likely to occur:

- >10 mm/hr (i.e. high intensity local rainfall events); or
- >25 mm in a 24-hour period (heavy frontal rainfall lasting most of the day); or,
- > half monthly average rainfall in any 7 days.

Prior to works being suspended the following control measures will be completed:

- Secure all open excavations to prevent ingress of rainwater/runoff;
- Provide temporary or emergency drainage in the form of diversion channels to prevent back-up of surface runoff; and,
- Avoid working during heavy rainfall and for up to 24 hours after heavy events to ensure drainage systems are not overloaded.

6.4.2 Site Drainage Management

To ensure runoff from construction areas does not flow directly into surface water bodies such as field drains downgradient of the proposed site, a series of diversion land drains will be installed for the following activities as per the CEMP provided in **Appendix 6.3, EIAR Volume II** and shown on **EIAR Drawing 1022**:

- Diverting runoff, particularly off-site runoff, along, across or around the areas of excavation;
- For collecting and channelling silty runoff downslope of the site to prevent it leaving the site/entering a watercourse;
- Collection of runoff from stockpiles or cut/fill embankments, slopes, and from other disturbed areas.

The first priority of drainage management will be to minimise the area of exposed ground when clearance of vegetation and topsoil strip commences. Polluted runoff can be greatly reduced by minimising the time between removal of the vegetation cover and establishment of the post-construction cover. The natural vegetation along the northern and eastern margin of the site will be preserved and sediment control measures will be carefully planned. Existing vegetation is far more effective at preventing erosion than newly planted vegetation. A development buffer zone will be implemented surrounding the drainage ditch along the northern boundary of the proposed site as shown on **Drawing 1022, EIAR Volume III**. The open ditch is generally in a somewhat degraded condition and inundated with vegetation but appears effective in draining surface water towards the existing industrial properties to the east, discharging to the adjacent storm water network in the industrial estate. No development will be planned or permitted within this drainage ditch with potential runoff from construction areas diverted into the land drains and storm pipe to the south of this existing drainage ditch. The implementation of a development buffer zone with a set back distance from the ditch will prevent any works or contamination within and along the banks of the ditch.

As mentioned above in section 6.3.1, excavations will involve removal of overburden to facilitate the installation of building foundations, drainage and services, together with creating level areas for access tracks / pathways. Soil excavations for foundation construction associated with the development will be stored during the construction phase in the western section of the site as shown on **Drawing 1022, provided in EIAR Volume III**. A 225mm perforated land drain will be installed on both sides of the excavation mounds to collect and contain run off, which will connect into a 225mm diameter PVC Storm Pipe located within the site compound which will act as the primary site drainage mechanism and will connect to the existing storm manhole at the site entrance. The land drains will be wrapped in theram to prevent sediments getting into the storm pipe. A Bypass Separator will be installed just inside the site entrance which will be cleaned out regularly. A third land drain will be installed east of the main building construction area to collect runoff before treatment via the bypass separator and discharge into the onsite storm pipe.

Silt fencing will be installed downslope of the area of stored excavated spoil mounds and also downslope of the facility building construction area to prevent sediment runoff as shown on **Drawing 1022, provided in EIAR Volume III.** An example of the proposed silt fencing is shown below in plate 6.1.

Plate 6.1: Fabric Silt Fencing at the toe of a slope

A silt trap will be installed at the proposed wheel wash for the duration of the construction phase to remove sediment before discharge into the storm pipe which flows onwards through a bypass separator and into the storm manhole at the site entrance, as shown on **Drawing 1022, EIAR Volume III**.

A 100mm temporary PVC foul pipeline will be installed to serve the staff toilets and canteen in the construction compound during the construction phase which will connect to the main foul sewer manhole by the site entrance, as shown in **Drawing 1022**.

Where it is required to import construction materials (e.g. stone, pipework, concrete etc), these materials will be delivered for secure storage, if required, within the site construction compound in the northern area of the site or direct to the area of site where the material will be immediately utilised. Run off from the construction compound will be directed to the 225mm PVC storm pipe shown on **Drawing 1022.**

All materials will be COSHH assessed and will be stored in accordance with the manufacturer's details. Dry stone may be stockpiled for use over a short period of time and topsoil will be stored for longer durations.

6.4.3 Environmental Monitoring during Construction

Method Statement / Environmental Operating Plan

The appointed contractor will draw up a Construction Method Statement (CMS) which will describe in detail how mitigation measures outlined in this EIAR and specifically the CEMP provided in **Appendix 6.3** of **EIAR Volume II** will be implemented by the construction works contractor. This method statement will be strictly adhered to by the contractor and will be monitored for effectiveness by the appointed contractor and ECoW as discussed below. A mechanism for reporting of pollution incidents will be agreed in advance between the contractor(s) and the developer.

Before earthworks commence on site, and before they are needed, the erosion control and sediment control measures discussed above will be put in place and functioning and must be inspected and approved by the Ecological Clerk of Works (ECoW).

Ecological Clerk of Works

An Ecological Clerk of Works (ECoW) will be employed who will make at least weekly site visits for the duration of the construction works and more frequently at start-up and during critical construction events such as concrete pours as outlined below;

- The ECoW will be responsible for carrying out regular audits of the Contractor's CMS on behalf of the proposed developer. In addition, the ECoW will be the primary person involved in the developer's monitoring role. The ECoW will be delegated sufficient powers under the construction contract so that he/she will be able to instruct the contractor to stop works and to direct the carrying out of emergency mitigation/clean-up operations;
- The ECoW will maintain a register indicating whether all mitigation measures have been carried out satisfactorily. This register will be signed off by the contractor's site foreman.

Separate from the on-going daily monitoring carried out by the contractor's project manager as part of the CMS, the ECoW shall carry out weekly inspections of the monitoring regime described below on behalf of the employer. The results will be stored in the ECoW's monitoring file and will be available for inspection/ audit by the Client, NPWS or IFI staff. The main elements of the inspection/ monitoring regime are as follows:

- Inspection of surface water treatment measures by the ECoW (silt fencing, sandbags, etc.) to ensure monitoring undertaken by the contractor on a daily basis is consistent with the CMS and onsite conditions;
- Wheel wash facilities shall be inspected on a weekly basis by the ECoW as will the effectiveness and condition of onsite silt traps;
- Stockpiles shall be monitored by the contractor's project manager on a daily basis while being filled or emptied and otherwise on a weekly basis;
- Control measures for works at or near water bodies such as drains shall be inspected on a daily basis by the contractor's project manager and by the ECoW when necessary;
- Concrete operations at or near drains shall be supervised and designated chute washing out facilities shall be inspected on a daily basis by the contractor's project manager and inspected weekly by the ECoW;
- The Contractor's CMS monitoring results shall be audited on a frequent basis by the ECoW (weekly at a minimum).

Where the ECoW has carried out an investigation of a release of sediment to a watercourse/drain causing a plume, the following procedure shall be followed:

- The discharge generating the sediment discharge shall be stopped immediately;
- The contractor will be required to take immediate action and to implement measures to ensure that such discharges do not re-occur.
- Works shall not recommence until appropriate corrective measures to avoid any repetition are put in place.
- Where the discharge is from one of the control measures associated with the works, the controlled discharge shall not recommence until written consent is received from the ECoW.

- Where the ECoW considers that the risk of a sediment release is high, he/ she shall inform the contractor and request protective action to be taken. Where the contractor does not take immediate action, the ECoW shall instruct the contractor to take action and same shall be reported to the Contract Manager and the Client.
- The ECoW will be delegated powers under the contract sufficient for these instructions to be issued and for an instruction to stop works or carry out emergency works.

6.5 Land Use

The proposed development site is located immediately to the rear of existing industrial premises situated along the main access road into Courtstown Business Park/Little Island. The site is zoned for industrial use within both the Cork County Development Plan and the Cobh Municipal District Local Area Plan as discussed above in Chapter 3. The proposed development reflects the usage aspirations for the site as stated by Cork County Council in the Development Plan and complies with the Council's future development plans for Little Island as an employment centre. The development site is not currently zoned or used for agricultural purposes and the installation of a waste transfer station at this location will not result in the utilisation of prime agricultural land as a local resource. The proposed development is surrounded by industrial uses to the east, north east and south with a distance of over 550m to the residential properties to the west.

The proposed waste transfer facility will not adversely impact on the neighbouring industrial properties and has been designed to ensure that impacts relating to amenity, noise and air quality, as discussed in the chapters below, will not be significant and will not result in adverse impacts on the nearest existing residential properties shown **Figure 1.3**, provided in **EIAR Volume III**. The proposed development will not impact on any future ambitions to develop medium density residential housing in the north and western extent of the former Harbour Point Golf course to the west of the site as part of a wider mixed-use development as outlined in Objective LI-X-01 of the Cobh Municipal District Local Area Plan, which also requires any development of this site to incorporate a landscape buffer between residential and other uses. A similar buffer is also required on the western boundary of the proposed development site under Policy Objective LI-I-02. The proposed development has been designed to minimise landscape and visual impacts on surrounding properties as described in Chapter 12, with a height of 12.8m which will not protrude into the local, visual landscape. The assessments carried out for noise (Chapter 8), air quality and odour (Chapter 9), and population and human health (Chapter 11) below demonstrate that the proposed waste transfer station will not result in adverse impacts on local residents or the potential to develop sites for non-industrial purposes within Little Island.

6.6 Summary and Conclusion

Mitigation measures have been proposed to ensure protection of the geological and hydrogeological environment during both the construction and operation stage.

It is considered that impacts on the soil, geological and hydrogeological features during both the construction and operational phases of the development will be insignificant. Mitigation measures are proposed to ensure minimal disturbance to the surrounding landscape and to prevent any degradation to groundwater underlying the sites. Any potential impact on land use will be negligible, minor and short-term in nature, and is limited to the construction phase of the proposed development.

7 Chapter 7 – Water (Hydrology)

7.1 Introduction

The potential impact from the construction and operation of the proposed waste transfer facility development on the receiving environment with respect to water is assessed in this Chapter.

7.1.1 Competent Expertise

OES Consulting were commissioned to undertake an assessment of the potential impacts associated with the activities and proposed developments previously outlined, on the hydrological characteristics of the site and surrounding environs.

The assessment was led by Eoin O'Connor B.Sc M.Sc, who received an Honours B.Sc degree in Environmental Science and Health from Dublin City University (DCU) and an M.Sc in Environmental Technology from University College Dublin (UCD). Eoin is experienced in undertaking environmental impact assessment and the preparation of EIA reports particularly in the areas of geology, hydrology and hydrogeology. Throughout his career Eoin has successfully completed numerous EIAs across a range of industries including the dairy sector, pharmaceutical and chemical manufacturing and high-tech industries.

7.2 Study Assessment and Methodology

A desktop assessment of the subject site was conducted using publicly available information primarily from sources outlined below. The assessment included both a desk-based study which involved reviewing available geological and hydrological information held by publicly available online resources on the site and surrounding lands and a number of site visits.

The following sources were reviewed:

- Met Éireann Meteorological Database (www.met.ie)
- Ordnance Survey Ireland Map Viewer (www.osi.ie)
- Geological Survey Ireland Spatial Data Viewer (www.gsi.ie)
- Teagasc online soil / subsoil maps (http://gis.teagasc.ie/soils/map.php)
- Water Framework Directive – Water Maps Map Viewer (www.wfdireland.ie)
- Environmental Protection Agency (EPA) Envision public viewer (www.epa.ie)
- National Parks and Wildlife Services Map viewer (www.npws.ie)
- Office of Public Works CFRAM Flood Mapping

The assessment was carried out according to the methodology specified in the following guidance documents:

- Environmental Protection Agency (EPA) Guidelines on the Information to be Contained in Environmental Impact Statements (2002);
- Environmental Protection Agency (EPA) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports - Draft (2017);
- EPA Advice Notes on Current Practice (in the Preparation of EIS) (2003); and
- Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes by the National Roads Authority (NRA, 2009).

A detailed site walkover survey was also completed in January 2017 to inform the assessment and ground truth the information gathered in the desk top assessment.

In assessing the importance/sensitivity of the existing environment with respect to Hydrology both within and surrounding area the following criteria set out in Table 7.1 have been applied.

Table 7.1 Estimation of importance of Hydrological attributes (National Roads Authority, 2009)

Importance	Criteria	Typical Example
Extremely High	Attribute has a high quality or value on an international scale	River, wetland or surface water body ecosystem protected by EU legislation e.g. 'European sites' designated under the Habitats Regulations or 'Salmonid water' designated pursuant pursuant to the European Communities (Quality of Salmonid Waters) Regulations
Very High	Attribute has a high quality or value on a regional or national scale	River, wetland or surface water body ecosystem protected by national legislation – NHA status Regionally important potable water source supplying >2500 homes Quality Class A (Biotic Index Q4, Q5) Flood plain protecting more than 50 residential or commercial properties from flooding Nationally important amenity site for wide range of leisure activities
High	Attribute has a high quality or value on a local scale	Salmon fishery Locally important potable water source supplying >1000 homes Quality Class B (Biotic Index Q3-4) 6 Flood plain protecting between 5 and 50 residential or commercial properties from flooding Locally important amenity for wide range of leisure activities
Medium	Attribute has a medium quality or value on a local scale	Coarse fishery Local potable water source supplying >50 homes Quality Class C (Biotic Index Q3, Q2- 3) Flood plain protecting between 1 and 5 residential or commercial properties from flooding
Low	Attribute has a low quality or value on a local scale	Locally important amenity site for small range of leisure activities Local potable water source supplying <50 homes Quality Class D (Biotic Index Q2, Q1) Flood plain protecting 1 residential or commercial property from flooding Amenity site used by small numbers of local people

In conjunction with the EPA impact assessment methodology and criteria as outlined in Chapter 2 above reference is also made to the NRA criteria (NRA, 2009) regarding impacts on the existing hydrological environment. These criteria are outline in Table 7.2 below.

Table 7.2 Criteria for Rating Site Attributes – Estimation of Magnitude of Impact on Hydrology Attributes (National Roads Authority, 2009)

Magnitude of Impact	Criteria	Typical Example
Large Adverse	Results in loss of attribute	➢ Loss or extensive change to waterbody or water dependant ecosystem ➢ Increase in predicted peak flood flood level >100mm ➢ Extensive loss of fishery ➢ Calculated risk of serious pollution incident >2% annually ➢ Extensive reduction in amenity
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	➢ Increase in predicted peak flood level >50mm ➢ Partial loss of fishery ➢ Calcualted risk of serious pollution incident >1% annually ➢ Partial reduction in amenity value
Small Adverse	Results in minor impact on integrity of attribute of loss of small part of attribute	➢ Increase in predicted peak flood level >10mm ➢ Minor loss of fishery ➢ Calculated risk of serious pollution incident >0.5% annually
Negligible	Results in an impact on attribute but not of sufficient magnitude to affect either use or integrity	➢ Negligible change in predicted peak flood level ➢ Calculated risk of serious pollution incident <0.5% annually
Minor Beneficial	Results in minor improvement of attribute quality	➢ Reduction in predicted peak flood level ➢ Calculated reduction in pollution risk of 50% or more where existing risk is >1% annually
Moderate Beneficial	Results in moderate improvement of attribute quality	➢ Reduction in predicted peak flood level >50mm ➢ Calculated reduction in pollution risk of 50% or more where existing risk is >1% annually
Major Beneficial	Results in major improvement of attribute quality	➢ Reduction in predicted peak flood level >100mm

7.3 Regional and Local Hydrology

On a regional scale, the proposed development site is located within the River Lee, Cork Harbour and Youghal River catchment area, Hydrometric Area 19 of the South-Eastern River Basin District (SERBD). Regional Hydrology is illustrated in **Figure 7.1, (EIAR Volume III).**

Surface water bodies in the study area include Lough Mahon, which together with the outer River Lee Estuary, forms the upper section of Cork Harbour SAC. Surface water flowing into Lough Mahon includes freshwater flow from the River Lee into the tidal estuary which is mixed with tidal seawater from the lower Cork Harbour.

Lough Mahon is a large waterbody within Upper Cork Harbour, stretching from Blackrock to Passage West and incorporating the estuary of the Douglas River. Several of Cork City's southern suburbs, including Blackrock, Mahon, Douglas and Rochestown lie along its shores. The estuary covers an area of 12.23km² and is influenced by the marine environment. The estuary receives the water of the River Lee, Glashaboy and Douglas. Little Island is located on the eastern side of Lough Mahon Estuary.

The River Lee flows into Lough Mahon in the upper harbour. The River Lee is one of the largest rivers in southwest Ireland and is the largest discharging into Cork Harbour, with a total catchment area covering approximately 2,000 sq. km.

On a more local scale there are no rivers or streams within or in the immediate vicinity of the development site. The northern boundary of the proposed site contains a drainage ditch which is associated with improvements for agricultural purposes. The open ditch is generally in a somewhat degraded condition and inundated with vegetation but appears effective in draining surface water towards the existing industrial properties to the east, discharging to the adjacent storm water network in the industrial estate. There are no other surface water features on the site.

7.4 River Basin Management Requirements

The Water Framework Directive (WFD) requires an integrated approach to managing water quality on a river basin basis, with the aim of maintaining and improving water quality.

The proposed waste transfer facility is located in the South-Western River Basin District (SWRBD) and as a result falls under the South-Western River Basin Management Plan. This plan was developed by the South Western Regional Fisheries Board, which is coordinated by Cork County Council. The river basin management plan sets out a framework for achieving the targets set out under the Water Framework Directive through Water Unit Action Plans.

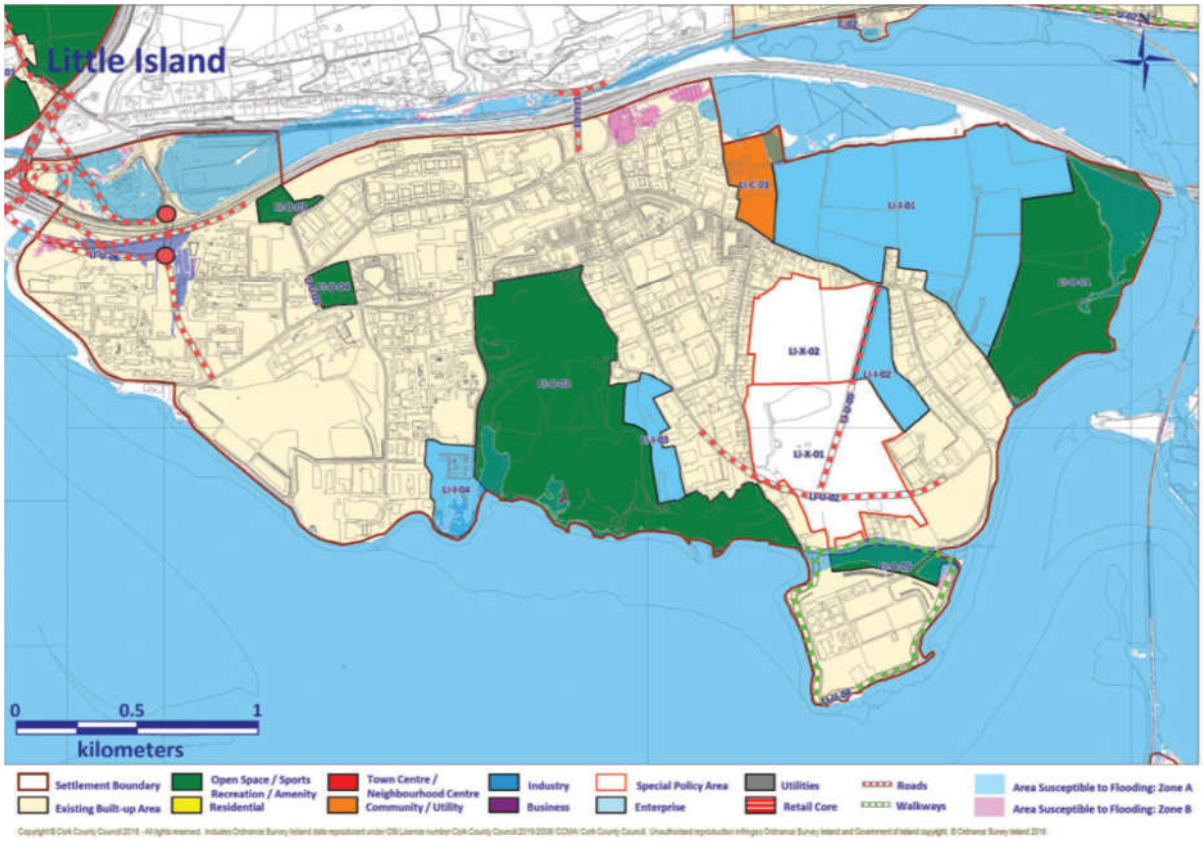
The EPA have assigned Lough Mahon an interim draft classification of “Good” status, i.e. must prevent deterioration below “Good” status, based on general physico-chemical elements, phytoplankton and macroalgal growths (SWRBD, 2008). It is important to note that the organisation and development of Ireland’s River Management Plans are currently under review. It is expected that a range updated or new policies and objectives will be introduced as part of this review.

7.5 Flood Risk

A review of the Office of Public Works (OPW) Catchment Flood Risk Assessment and Management (CFRAMS) flood mapping integrated maps 38 and 39 provided in **Appendix 7.1** (**EIAR Volume II**) determined that the proposed development site is not at risk of fluvial, coastal or pluvial flooding.

A review of the Cobh Municipal District Local Plan land zoning map for Little Island provided in Plate 7.1 below shows that the site is not located within Flood Zone A or B. As the site is not at risk of flooding, as confirmed by the OPW mapping, it was not deemed necessary to complete a flood risk assessment for the proposed development.

Plate 7.1 Flood Risk and Land Zoning outlined in the Cobh Municipal District Local Plan



7.6 Transitional Water Quality

According to the EPA, water quality in Cork Harbour is classified as moderate and is reflected by growths of *Enteromorpha* and *Ulva*. However, Lough Mahon (inner part of harbour) has recovered somewhat since the cessation of untreated sewage discharges into the Lee Estuary and Lough Mahon as part of previous phase of the Cork Main Drainage Project. High nutrient levels in the harbour have been linked to the occurrence of algal blooms in which certain species of phytoplankton reach very high densities, release toxins and contaminate shellfish.

There has been a marked improvement in the water quality status of Lough Mahon, which is now classified as 'intermediate', having previously been categorised as eutrophic in the period 1999-2003. According to recent monitoring records (EPA, 2007), chlorophyll concentrations, which were elevated in the previous period, are within acceptable levels. In general, dissolved oxygen levels have continued to improve and only marginally failed to meet the under-saturation criterion, representing a considerable improvement on previous periods.

The improvements observed in the Lee estuary and Lough Mahon are believed to be associated with the Cork Main Drainage Project which was completed towards the end of 2004. Discharges of raw sewage, which had previously entered the lower Lee estuary and Lough Mahon, are now redirected to the waste water treatment plant at Carrigrennan, Little Island where they receive secondary treatment before being discharged into Lough Mahon.

7.7 Proposed Site Drainage Design

There will be no discharges directly to surface waters during the construction or operation of the proposed facility. There will also be no direct discharges to ground during the operational phase of the facility which will be primarily covered with hardstanding, roads, parking and yard areas, apart from the 20m band of trees on the western site boundary. All run-off and process water will be controlled and will be directed immediately to the proposed site drainage network which will connect into the existing storm and foul sewer connection at the entrance of the development as shown on **Drawings 1006** and **1007.**

Waste water emissions from the proposed facility will comprise process waste water and domestic sewage. Foul effluent will consist of process effluent from waste handling activities within the municipal recycling building and discharges (washings and surface water) from the bin washing area of the site. This effluent will be monitored on a monthly basis as per conditions of the Local Authority Permit/EPA Waste Licence.

As mentioned above in Section 4.10, all process wastewater from the site will be directed off-site to connect with the existing Little Island municipal foul drainage network. Foul drainage at the site will connect into the existing foul drainage network located at the entrance of the development as shown on **Drawing 1007**. A connection to the municipal sewer network will be established for the sanitary waste waters associated with the office block. Emissions to sewer are solely associated with the sanitary requirements of the office buildings on site, and do not include process water emissions**.**

The external hard standing areas under the canopy where the skips will be stored will drain to the foul sewer with runoff passing through an interceptor before discharge. Runoff from the internal floor drainage for the building will pass through an interceptor (full retention) prior to discharge to the foul sewer. Foul water will be cleaned of petrochemical contamination by passing through a 4000 litre full retention separator. Surface water from the roof will discharge via a class 2 interceptor to the storm sewer and will be emitted to the storm sewer running west-east direction along the southern and northern boundaries of the site.

Leachate run off will be kept to a minimum. Municipal waste will be processed once it lands on site so there will be no leachate from its storage. The waste will be sealed within 10 layers of strong plastic wrap (1200-gauge polyethylene) to make sure there is no leachate released from the bales.

7.8 Site Evaluation

Based on methodology outlined above, the criteria for rating site importance of hydrological features, this site is rated as low importance based on the following points.

- There are no significant receiving waterbodies located within or in the immediate vicinity of the proposed development site,
- The site is located <0.5km from an area of importance i.e. Cork Harbour SPA and Great Island Channel cSAC, however there are no direct pathways from the proposed development to these areas. There is sufficient distance and land between the proposed development and these areas,
- No local potable water supplies have been identified within or in proximity to the site.

7.9 Assessment of Impacts of the Proposed Development

It is noted that in assessing the likely or potential impacts on surface water/hydrology those potential impacts identified and discussed previously in Chapter 6 are of relevance to this assessment and are also applicable. For clarity however, these potential impacts are also discussed below where relevant.

7.9.1 Construction Phase

The potential impacts of the proposed waste transfer development on surface water are outlined below:

- Contamination of the onsite field drain through the ingress of chemicals and construction materials such as concrete;
- Seepage of chemicals from construction materials and polluted water into the ground, and
- Alteration of water table levels.

The construction phase of the development will involve the excavation of soils for foundation construction to provide a base for new warehouse infrastructure and forecourt.

Sedimentation and Erosion

Excavation and earthworks associated with the construction phase could give rise to sediment run-off and potentially impact aquatic receptors. The proposed development is located approximately 0.4km from the Great Island Channel cSAC and will require excavation of soils for foundation construction. There are no watercourses within the proposed development site and therefore no direct links between the site and the cSAC.

Oils, Lubricants and Construction Materials

The main impacts associated with the construction phase of the development will be to the potential degradation of a drainage ditch within the site. The construction and operation of the proposed development involves the use of a range of materials and fluids. These include concrete pours, fuels and lubricants used for construction machinery, which if spilled, have the potential to give rise to contamination of surface and ground waters.

The issue of accidental spillage of hydrocarbons such as diesel and lubrication oil during refuelling of plant machinery is a potential risk during the construction phase. Mitigation measures regarding the handling of potentially environmentally hazardous substances such as oils and lubricants are outlined below in section 7.10.

7.9.2 Operational Phase

It is considered that the operation of the development will have negligible or no variation to hydrology on and nearby the site. The vast majority of the site in which process activities will take place will be located on made ground and hard standing. Site infrastructure has been designed to include sufficient site drainage to divert and control any potential spills or leaks which may otherwise enter soils or groundwater.

The proposed development will be connected to the Cork City municipal water supply and will require a supply of $10m^3$ per day which is not a significant increase in water demand and as such will not

adversely impact local water supplies to Little Island. No groundwater abstraction or use of ground water from wells is proposed as part of the proposed development.

There are no watercourses within the proposed development site and therefore no direct links between the site and the cSAC. There is an absence of watercourses that could provide a pathway for surface water run-off or contaminants to reach Lough Mahon at Cork Harbour. A drainage ditch in the northern section of the site appears effective in draining surface water towards the existing industrial properties to the east. This channel will be protected and maintained during the construction phase of the development with the implementation of a development buffer zone surrounding the ditch as discussed above in Section 6.4.2 and the CEMP (**Appendix 6.3, EIAR Volume II**) and will continue to operate as a drainage ditch during the operational stage of the development.

The risk of downstream impacts therefore is considered low. Rainwater will be collected onsite and used in onsite truck washing and as toilet water. All other surface draining water will pass through a Class 1 hydrocarbon interceptor along with all other surface drainage at the site and will flow into the municipal storm water sewer. All waste water will be discharged to the municipal foul drainage system, via a Class 2 hydrocarbon interceptor, and no discharges to surface waters will occur at the site. The existing water infrastructure and drains at the site are sufficient to service the proposed development.

The storm water and foul drainage at the site will connect into the existing respective municipal supply networks located at the entrance of the development as shown on **Drawings 1006 and 1007,** provided in **EIAR Volume III**.

7.10 Mitigation Measures

As with any civil engineering project of this nature it is vital to ensure that prior to works commencing on site, adequate mitigation measures are put in place. All such mitigation measures will be undertaken by the Construction Works Contractor (CWC) through the implementation of a detailed Construction Method Statement (CMS) which will incorporate and implement the mitigation and protection measures outlined in the Construction Environmental Management Plan (CEMP) provided in **Appendix 6.3, EIAR Volume II**. The Project/Site manager, who represents the Civil Works Contractor (CWC) will be responsible for enforcing the technical and contractual requirements of the project.

The CEMP has been produced for the purpose of protecting water quality, groundwater, preventing soil run-off protecting sensitive habitats and species and is provided in **Appendix 6.3, EIAR Volume II**.

As mentioned above in section 6.4.1, the works programme for the initial construction stage of the development will take account of weather forecasts, and predicted rainfall in particular. Large excavations and movements of subsoil or vegetation stripping will be suspended or scaled back if heavy rain is forecast.

Many of the mitigation measures outlined in Section 6.4 above are similarly being proposed for the protection of surface waters and hydrological interests during construction. Despite the absence of surface water courses within or surrounding the site and the lack of hydrological links with Lough Mahon the North Channel estuary areas, as part of a comprehensive best practice approach to the protection of surface water, the following mitigation measures will be implemented to manage potential impacts to hydrology during construction stages, and they include:

- Interception, channelling and discharge of surface water from excavations and exposed soil surfaces through the use of land drains, storm pipes and silt fencing;

- Cordoning off of the drainage ditch in the northern part of the site to protect from spillages and contamination from construction materials;
- Installation of silt fencing and hydrocarbon interceptors at sensitive outfalls in the early stage of the construction project;
- Construction of land drains to prevent surface water runoff from entering excavations as shown on **Drawing 1022, EIAR Volume III**;
- Placing of granular materials over bare soil in the vicinity of drainage channels in order to prevent erosion of fines and rutting by site traffic;
- Storage of fuel, oils and chemicals on an impermeable base away from drains and within the designated construction compound area in the north western area of the site.
- Refuelling of plant and vehicles on impermeable surfaces away from drains;
- Provision of spill kits on the site and in particular at high risk and sensitive locations, and
- Installation of wheel wash and plant washing facilities with fluid retention for appropriate treatment and disposal and the installation of a silt trap through which run-off from the wheel wash will flow before entering the proposed 225mm PVC Storm Pipe shown on **Drawing 1022**.

Additional mitigation factors and measures for the control of pollution and general protection of water and ground water are described below.

- It will be necessary to store surplus excavated material within the western part of the site until such time as it can be used for landscaping or reinstatement. It is noted that topsoils and subsoils will be stored separately. Any excess materials will be disposed of to a licensed disposal facility;
- Excavations will be dug during drier periods, if possible, and any spoil material will be temporarily placed on the uphill slope to reduce the likelihood of runoff entering the excavations;
- A purpose designed, removable, drip tray will be provided beneath connection points to catch any residual oil during filling and disconnection of the flexible tanker hose. The drip tray will be regularly emptied and disposed of off-site by a specialist licensed contractor;
- Raw or uncured waste concrete will be disposed of by removal from the site;
- Before release to the environment, wash down water from exposed aggregate surfaces, cast-in-place concrete and from concrete trucks will be treated to a level which will ensure that total suspended solids in discharges to surface waters (including drains) will not exceed 25mg/l. Furthermore wash out water will not be released to the environment until it has reached a neutral pH;
- Only the chute of the concrete delivery truck will be cleaned on site, using the smallest volume of water necessary. Concrete trucks will be directed back to their batching plant for washout;
- Clearly visible signs will be placed in prominent locations close to concrete pour areas, stating that washout of concrete lorries is not permitted on the site;
- The arrangements for concrete deliveries to the site will be discussed with suppliers before commencement of work, agreeing routes, prohibiting on-site washout and discussing emergency procedures;
- So as to avoid spillage, concrete will not be transported around the site in open trailers or dumpers. All concrete used will be pumped directly into the shuttered formwork from the delivery truck;
- Concrete pours will be avoided where prolonged periods of heavy rain are forecast and covers will be available for freshly placed concrete to avoid the surface washing away in heavy rain;
- Fuels, lubricants and hydraulic fluids for equipment used on the construction site, as well as any solvents, oils, and paints will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to codes of practice (Enterprise Ireland BPGCS005);

- Oil booms and oil soakage pads will be kept on site to deal with any accidental spillage;
- Any spillage of fuels, lubricants or hydraulic oils will be immediately contained and the contaminated soil removed from the site and properly disposed of;
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or re-cycling;

All of the mitigation measures proposed for the protection of surface waters and the hydrological environment are outlined in the CEMP provided as **Appendix 6.3, EIAR Volume II.**

Environmental Monitoring

As mentioned above in Chapter 6, the project CWC will implement a monitoring programme of the mitigation measures on site and will monitor ground conditions, water levels, unsuitable weather periods and will implement best practice environmental construction techniques on site in relation to the protection of drainage ditches and ground water quality. An ECoW will be appointed to independently monitor the implementation of the mitigation measures in the constractor's CMS which will reflect those within the CEMP and will also monitor and evaluate overall environmental performance of the construction site and monitoring programme being undertaken by the CWC.

Environmental monitoring undertaken by the ECoW during the construction phase will include but will not be limited to the following:

- Inspection of any surface water treatment measures including wheel wash facilities, designated chute washing out facilities, and attenuation and control features such as silt fencing and silt traps etc. on a daily basis at start-up and during critical construction events such as concrete pours, and on a weekly basis at other times;
- Monitoring of stockpiles on a weekly basis;
- Daily visual inspection of any drainage channels and ditches onsite in proximity to the work at start-up and during critical construction events such as concrete pours;
- The Contractor's monitoring results will be audited on a weekly basis to ensure their implementation onsite;
- Monitoring habitats and species during the course of construction works and effectiveness of mitigation;
- Provision of advice to minimise potential disturbance to wildlife;
- Provide recommendations on appropriate responses / actions to site specific issues (e.g. identification of previously unrecorded breeding sites during construction works); and
- Liaison with NPWS, IFI and other prescribed authorities, when required.

The site contractor assigned to the development of the facility will appoint a designated person to undertake monitoring/inspections as required within the CEMP on a regular basis and will include the following:

- Daily inspection of surface water treatment measures including wheel wash facilities, designated chute washing out facilities, land drains, storm pipes, silt fencing and other attenuation and control features such as silt traps etc;
- Daily inspection of stockpiles;
- Recording of performance of all drainage management measures, and
- Reporting of any pollution incidents within the CEMP and immediate notification of this to the appointed site ECoW.

This daily monitoring by the appointed site person will be audited on a weekly basis by the ECoW.

7.11 Summary and Conclusion

Mitigation measures have been proposed to ensure protection of the hydrological environment during both the construction and operation stage.

It is considered that impacts on the hydrological environs during both the construction and operational phases of the development will be insignificant. Mitigation measures are proposed to ensure minimal disturbance to the surrounding landscape and to prevent any degradation to surface waters downgradient of the site. Both erosion and sediment entrainment in runoff produced during excavation works are considered the most significant risk particularly to drainage ditches on site during the construction stage. The proposed mitigation measures will ensure that this risk is kept to a minimum. It is noted that additional care will be required when working during concrete pours.

With the implementation of appropriate mitigation measures as outlined above, the predicted impact associated with the proposed development and facility is considered to be a negligible, neutral and imperceptible impact. That is, an impact which is of insufficient magnitude to affect either use or integrity, which does not affect the quality of the environment and which is capable of measurement but without noticeable consequences.

8 Chapter Eight – Noise and Vibration

8.1 Introduction

This chapter presents the noise and vibration impact assessment of the proposed development at Little Island, Co. Cork, which comprises a new warehouse facility to provide a waste transfer and recycling plant together with associated offices and site infrastructure.

Key issues to be addressed in this chapter include identification and assessment of potential short-term construction noise and vibration impacts arising from the development phase and potential long-term noise impact on nearby Noise Sensitive Locations (NSLs) arising from the operation of the facility, and in particular, fans associated with the odour treatment unit.

8.1.1 Competent Expertise

This chapter has been prepared by Siobhan Maher whose qualifications include M.Tech. Environmental Management, B.Sc. Analytical Science and a Dip. Acoustics and Noise Control Engineering. Siobhan is a Member of the Institute of Acoustics (MIOA) and is the managing director of Redkite Environmental with over 19 years of experience providing environmental consultancy and environmental assessment services to business, industry and public sectors. Siobhan has experience in, but not limited to the areas of; noise and vibration impact assessment, building acoustics (design and standard assessment), environmental noise prediction modelling and occupational noise assessment.

8.2 Methodology

8.2.1 Characterisation of the Receiving Environment

The receiving ambient sound environment or existing soundscape has been characterised by field survey.

A survey was completed on the 4th and 5th January 2017 at five Noise Monitoring Points (NMPs) between the hours 14.00 – 24.00 on the former date and between the hours 00.00 – 02.30 on the latter. The measurement methodology followed was in accordance with the recommendations of the following:

- International Standards Organisation Document: ISO 1996 Acoustics – Description, Measurement and Assessment of Environmental Noise, Part 1, Basic Quantities and Assessment Procedures (2016) and Part 2 Determination of Environmental Noise Levels (20071);
- The EPA Guidance Note for Noise: License Applications, Surveys and Assessments in Relation to Scheduled Activities, (NG4), revised January 2016, and
- BS4142:2014 Methods for Rating and Assessing Industrial and Commercial Sound.

Ambient noise monitoring was undertaken at the locations as described in Table 8.1 below and illustrated on **Figure 8.1 Noise Monitoring Points (EIAR Volume III)**. The locations were chosen to be representative of Noise Sensitive Locations (NSLs) with the exception of NMP1 which is located within the site.

[1] New version of Part 2 was published in July 2017.

Table 8.1 Noise Monitoring Points

Location	Grid Ref.	Description
NMP1	W76977 71693	28mOD. Southern site boundary.
NMP2	W76668 71030	3mOD. Clash Road. Southwest of Golf course and site. In parkland area.
NMP3	W76912 72123	25mOD. Ballytrasna Park Road. Northern boundary of agricultural field to the north of the site.
NMP4	W76328 71906	23mOD. Clash Road. West of Golf course and site.
NMP5	W77259 71828	15mOD. On road to the east of Courtstown Industrial Park.

The Photolog in **Appendix 8.1 (EIAR Volume II: Appendices)** illustrates the ambient monitoring locations.

Ambient monitoring was conducted during the day, evening and night time periods for approx. 15-minute events. Three, one and two repeat measurements were completed during the day, evening and night time respectively at each location. The meters were set to log L_{Aeq}, L_{A90}, L_{A10}, L_{Amax} and L_{Amin} over 100 milli-second intervals to assist in later post processing and analysis.

Survey personnel noted all primary noise sources contributing to the ambient sound environment. The noise meters were attended at all times. Detailed field notes were recorded during the survey.

Overall weather conditions prevailing during the survey were suitable for noise monitoring. The weather was very calm and cold during all monitoring events with no rain or wind.

Sound measurement was carried out using two Type 1 Sound Level Meters and associated hardware (calibrators and tripods) and software. The meters were placed in open areas where possible >3.5m from reflecting surfaces and a minimum of 1.2m above ground level. The meters were calibrated before, during and after use. The observed drift was <0.2 dB. The sound levels were measured using the A-weighted network, and a fast sampling interval. Un-weighted 1/3 octave spectra were logged throughout. Wind speed was measured using a portable anemometer. Further details of the monitoring equipment used are set out in Table 8.2 below.

Table 8.2 Monitoring Equipment

Instrument Type	Manufacturer	Model Number	Serial Number
Sound Level Meter	NTi	XL2	A2A-08898-E0
Microphone	NTi	MA220	5062
Acoustical Calibrator	NTi/Larson Davis	CAL 200	11728
Sound Level Meter	Cirrus Research plc	CR:171B	G056143
Acoustic Calibrator	Cirrus Research plc	CR:515	55191

The Acoustic Calibrators were calibrated to published data as described and recommended by IEC standard Electroacoustics – Sound Calibrators IEC 60942:2003, IEC 90942:1997, BS EN 60942:1998 and/or BS EN 60942:2003. **Appendix 8.2 (EIAR Volume II: Appendices)** contains calibration certs for the equipment used.

8.2.2 Prediction of Construction Phase Impacts

Prediction of construction noise associated with the Proposed Development has been conducted where data is available using Guidance outlined in BS 5228: Part 1: 2009+ A1:2014, Noise and Vibration Control on Construction and Open Sites. According to this standard, a number of factors such as site location, existing ambient noise levels, duration of site operations, hours of work and attitude of the site operator are likely to affect considerations of acceptability of site noise.

8.2.3 Prediction of Operational Phase Impacts

A site visit to a similar waste transfer and recycling facility was conducted in January 2017. Sound pressure levels were recorded at known distances from the main external sources and are used in this chapter in association with typical equations used for the prediction of sound attenuation as detailed in ISO 9613.-2 – 1996 Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation. This method requires the use of sound power levels but has been adapted to suit the data available.

A site visit and review of a compliance report for a similar facility located in Cork and licensed by the EPA was also completed to identify typical potential noise impacts associated with the Proposed Development.

8.2.4 Criteria for Assessment of Noise Impact and Determination of Significance

The following criteria have been used where appropriate to assess noise impacts and effects described in this report:

Table 8.3 Criteria for Noise Impact Assessment

Criteria for Extent of Noise Impact (dB)	Noise Impact Magnitude	Magnitude Rating
>10	Severe	Very high
5 to 10	Substantial	High
3 to 5	Moderate	Medium
1 to 3	Slight	Low
<1	No impact	Very Low

The above table describes the noise impact i.e. the change in noise levels before and after implementation of a Proposed Development. The table does not however describe whether the change in noise levels is significant.

Relying solely on change in noise level is not appropriate because it risks ignoring the context of the noise change. The actual effect on NSLs and hence significance takes account of other relevant factors such as time of day of occurrence, averaging periods, nature of source, frequency spectra, frequency of occurrence and absolute level. The linking of magnitude of impact to likely effects and significance is described in Table 8.4 below.

The above assessment procedure is in line with recently published methodologies set out in BS4142:2014 Methods for Rating and Assessing Industrial and Commercial Sound and Institute of Environmental Management and Assessment (IEMA) Guidelines for Environmental Noise Impact Assessment, 2014.

Table 8.4 Significance of Effects

Impact Magnitude	Receptor Perception	Significance
Negligible	No discernible effect	Not significant
Slight	Non-intrusive	Less likely to be significant ↓ More likely to be significant
Moderate	Intrusive	
Substantial	Disruptive	
Severe	Physically harmful (e.g. sleep disturbance, cardio-vascular effects)	Always significant

8.3 Definitions

The following definitions apply in this chapter:

L_{Aeq} is the A – weighted equivalent continuous sound level – the sound level of a steady sound having the same energy as a fluctuating sound over a specified measurement period.
L_{A10} is the A-weighted noise level which is exceeded for 10% of the specified measurement period. This gives an indication of the upper limit of fluctuating noise such as that from road traffic.
L_{A90} is the A-weighted noise level exceeded for 90% of the measurement period and is useful in providing an indication of the background noise level experienced over the measurement period.
L_{AFmax} is the maximum A-weighted noise level measured during a cycle with a fast time weighting.
L_{AFmin} is the minimum A-weighted noise level measured during a cycle with a fast time weighting.
$L_{Ar,T}$ - The Rated Noise Level is equal to the LAeq during a specified time interval (T), plus specified adjustments for tonal character and/or impulsiveness of the sound.
The "A" suffix denotes sound levels that have been "A-weighted" in order to account for the non-linear nature of human hearing to sounds of different frequencies.
Lw - Sound power is the sound energy radiated in all directions by a source. Total sound power in watts is equal to the intensity in watts/m^2 multiplied by the area in m^2.
Tonal sounds are defined as sounds which cover a range of only a few Hz which contains a clearly audible tone, i.e. distinguishable, discrete or continuous noise (whine, hiss, screech, or hum etc.) are referred to as being 'tonal'.

A simplified objective method for determining if tones are present is set out in Annex D of ISO 1996-2:2007(E) Acoustics – Description, measurement and assessment of environmental noise, Part 2: Determination of environmental noise levels. According to the simplified method, an audible tone is normally defined as being greater than or equal to the following values in both adjacent one third octave bands:

- 15dB in low frequency one third octave bands (25Hz to 125Hz);
- 8dB in middle frequency bands (160Hz to 400Hz), and;
- 5dB in high frequency bands (500Hz to 10,000Hz).

1/3 Octave Analysis is defined as frequency analysis of sound such that the frequency spectrum is subdivided into narrower bands of one–third of an octave each in order to objectively determine if a sound is tonal or not. The simplified method has been applied in this report.

All sound levels in this report are expressed in terms of decibels (dB) relative to 2x10-5 Pa.

8.4 Baseline Description of Existing Conditions

8.4.1 Locational Context

The site of the Proposed Development is currently greenfield/rough grassland and adjoins the western extents of the existing Harbour Point Business Park comprising commercial/light industrial development. A disused golf course borders the site to the immediate west and waste ground lies to the south. Agricultural land in tillage forms the northern boundary of the site. The busy primary N25 route from Cork to Rosslare lies approximately 1.2km north. The immediate area is characterised by emerging light industrial, retail and commercial development.

The site is located close to the tip or high point of Little Island and slopes down by approx. 6m from west to east. The highest point in the site is 28.5mOD in the north-western corner. The nearest NSLs are located approx. 320m to the east beyond the Business Park (**Figure 8.1** - NSL 5) and 370m northeast at Ballytrasna Park (**Figure 8.1** - NSL3). NSLs to the east are at a lower elevation than the site (15m OD) as they are closer to the sea while those to the northeast are at a similar elevation to the centre of the site. The site boundary is visible from NSLs on the Ballytrasna Road although the site is currently screened by intervening buildings from those to the east. NSLs on and off the Clash Road to the west (NSL4) are screened more or less completely from the site by the local topography as the land also slopes down to the west from the island apex close to the north-western site boundary. NSL locations are shown on **Figure 8.1 (EIAR Volume II: Appendices)**.

8.4.2 Existing Ambient Sound Environment

Summary results of ambient sound monitoring are set out in Tables 8.5, 8.6 and 8.7 overleaf. **Appendix 8.3, EIAR Volume II** contains logged results and 1/3 octave band spectra. The ambient sound environment at monitoring locations close to the Ballytrasna and Clash Roads (NMP3 and NMP4 respectively) can be described as dominated by transportation and, to a much lesser extent, industrial sources. The site of the Proposed Development (NMP1) and areas to the south of Little Island (NMP2) are generally less influenced by these sources due to separation distance. Similarly, NMP5, where the nearest NSLs to the east are located is quieter than other roadside monitoring locations (NMP3 and NMP4) as this area is less influenced by passing traffic.

The location of the Proposed Development and the nearest NSLs to the north on the Ballytrasna Road are not in a "quiet area" or an area of low background noise as defined in the EPA Guidance document, NG4. Accordingly, typical limits that may apply to the activity at NSLs to the north are defined as follows:

- Daytime (07:00 to 19:00hrs) – 55dB LAr,T2;
- Evening (19:00 to 23:00hrs) – 50dB LAr,T;
- Night-time (23:00 to 07:00hrs) – 45dB LAeq,T.

It is recommended that the above limits be reduced by 10 decibels for residential NSLs to the south (NMP2), east (NMP5) and west (NMP4) where lower background levels were recorded.

[2] LAr,T is a rating level which includes a penalty for tonal or impulsive noise where present (refer to Section 8.3 for further definition).

Table 8.5 Summary Results, Daytime January 2017

Location/ Reading No.	Start/End Time	Overall Duration (min:sec)	$L_{Aeq,t}$	$L_{A10,t}$	$L_{A90,t}$	L_{AFmax}	Description of Ambient sound environment
NMP1 #1 NMP1 #2 NMP1 #3	14.39 – 15.24	45	44	46	39	62	Quiet location on site. Distant continuous traffic in background and predominant noise source. Very little activity in Business Park to the east, occasional sounds of roller doors, muffled reverse beeping. Intermittent cars audible on Courtstown Road. Occasional birdsong.
NMP2 #1 NMP2 #2 NMP2 #3	15.39 – 16.24	43:17	42	44	31	69	Very quiet with some amenity users in area. No traffic sound affected this location. Natural sounds including dogs barking. Some overhead planes and a helicopter passed by. A wastewater treatment plant located south at the southern tip of the island is audible.
NMP3 #1 NMP3 #2 NMP3 #3	16.44 – 17.31	46	70	75	46	85	Regular passing intermittent traffic on the Ballytrasna Road. Grass cutting on verge continuously ongoing affecting background levels.
NMP4 #1 NMP4 #2 NMP4 #3	17.54 - 18.40	46	59	55	38	82	Occasional passing cars. Low hum audible continuously from industrial development west, predominant when there are no passing cars. No distant traffic audible.
NMP5 #1 NMP5 #2 NMP5 #3	17.37 – 18.24	45	46	47	40	75	#3 disregarded due to dog barking beside meter for duration. HGVs exiting nearby site. Typical residential neighbourhood sounds occurring otherwise. Train audible in distance.

Day 07.00 – 19.00; evening 19.00 -23.00, night 23.00 -07.00

Table 8.6 Summary Results, Evening time, January 2017

Location/ Reading No.	Start/End Time	Duration (min:sec)	$L_{Aeq,t}$	$L_{A10,t}$	$L_{A90,t}$	L_{AFmax}	Description of Ambient sound environment
NMP1	20.26 – 21.04	38.40	45	48	40	67	Trucks loading and unloading at Fast Track couriers. Distant N25 traffic in background. Person walking dog on site.
NMP2	22.35 – 23.00	25	34	35	32	49	WWTP to the south audible continuously in background. Very distant traffic. One local car movement.
NMP3	21.54 – 22.58	33.43	60	59	41	84	Intermittent passing cars. N25 distant traffic and continuously audible plant from the Business Park audible. Also, other intermittent plant noise audible from the Business Park to the west .
NMP4	21.17-21.47	30.10	56	49	35	80	Very distant motorway traffic audible. Throbbing type plant sound audible from industrial development west. Occasional passing car on Clash Road. Cars passing at speed hence elevation in L_{Aeq} above L_{A10}.
NMP5	21.12-21.43	30	42	41	35	69	Distant traffic main background sound. Some sounds from the receptor nearby. Cattle lowing also.

Day 07.00 – 19.00; evening 19.00 -23.00, night 23.00 -07.00

Table 8.7 Summary Results, Night time January 2017

Location/ Reading No.	Start/End Time	Duration (min:sec)	$L_{Aeq,t}$	$L_{A10,t}$	$L_{A90,t}$	L_{AFmax}	Description of Ambient sound environment
NMP1 #1	23.56 – 00.31	35.10	40	43	35	58	Fast track loading/unloading nearby. Forklift reverse beepers and some banging audible. Distant N25 traffic in background.
NMP1 #2							
NMP2 #1	23.00 – 23.43	43	32	34	30	47	WWTP audible continuously in background. Very distant traffic. One local car movement.
NMP2 #2							
NMP3 #1	01.21 – 01.52	30	56	50	36	80	Distant traffic. Reversing forklift audible. Intermittent passing cars elevating L_{Aeq}.
NMP3 #2							
NMP4 #1	00.37-01.08	30	44	39	30	79	Distant traffic audible. Some reverse beeping. One car during #1 elevated L_{Aeq} during that reading.
NMP4 #2							
NMP5 #1	01.57-02.27	30	30	32	27	57	Some bird calls. Loading audible from Park. Occasional distant traffic.
NMP5 #2							

Day 07.00 – 19.00; evening 19.00 -23.00, night 23.00 -07.00

8.5 Assessment of Impacts

8.5.1 Construction Phase

Details of the duration of the construction works, sources and typical activities envisaged were provided by the engineering design team as set out below.

The works will have a duration of approximately 12 – 15 months.

The types of activities that will be involved will be as follows:

- Bulk Excavation;
- Concrete Pours;
- Erecting Structural Steel Frame;
- Erecting Cladding & Doors;
- External works, and
- Fit out of building.

Standard industry track machines and dump trucks will be used. The design engineers have provided the following list of equipment that is likely to be used during the construction phase:

- Cat 302 20t excavator;
- Hitachi 20t excavator;
- A25 Volvo dumper;
- Terex side dumper;
- Manitou side forklift;
- Mobile crane;
- Terex 4t roller;
- Plant tools, con saws and drills etc.
- Skylift.

The sound pressure or power data for the above sources is not easily available, therefore similar source data has been used to estimate the construction noise impact at the nearest NSLs as provided in BS5228-1:2009 +A1:2014: Code of Practice for Noise and Vibration Control on Construction and Open Sites: Part 1: Noise.

It is difficult to predict with certainty the noise impact associated with the construction phase as the construction works will be subject to a tendering phase. In this regard, the following factors are relevant:

- The sound power ratings used for each piece of equipment in the assessment, as taken from BS5228, may vary from the actual equipment used on site (Annex C of the Code of Practice outlines various noise levels for each type of equipment);
- It is not possible to outline for definite the type of equipment which will be in use, or the duration of time each piece of equipment will be in use; and,
- Noise emissions from construction vary in intensity and character but also in location and over time.

In addition to the general list of equipment provided by the designers, the following can be expected to apply:

- Tracked excavators equipped with breakers are likely to be used to break up rock that may be encountered during earthworks.
- Compactors will be used to compact hardcore and on tarmacked areas.
- Concrete will be brought to site and pumped, after which it will be compacted and reinforced.
- Typically, generators will also be used.
- The Skylift crane will be used to move and place precast concrete sections, metal cladding and steel beams into place. Steel beams will need to be bolted and welded.

Based on the above general details, Table 8.8 overleaf details typical noise sources that may be in operation at different times during the construction phase.

It is important to note however that the predictions in Table 8.8 do not specify the time over which the noise source will be active i.e. the predictions are expressed as $L_{Aeq,t}$ as opposed to $L_{Aeq,}$ 15mins or 30mins or 1 hour as the case may be. So, if for example a dump truck (e.g. $L_{Aeq,t}$ is predicted to be 82dB at 10m) was active over 5mins in a 1 hr assessment period then the $L_{Aeq,1hr}$ would reduce to 71dB using the following equation:

Eqn 1: $$L_{Aeq,\ 1hr} = 10 \log ((t1 \times 10^{L1/10} + t2 \times 10^{L2/10})/T)$$

Where t1 is 5x60secs:

- t2 is 55 x 60 secs
- L1 is 80dB
- L2 is 55dB (measured ambient level)
- T is 60x60secs

Additionally, screening by local topographical features and buildings has not been accounted for in the predictions in Table 8.8. Furthermore, masking by continuous existing sources will occur. Accordingly, it is considered likely that the construction phase will not have a significant impact on the nearest residential NSLs. Construction related noise is likely to be short term and intermittent slight negative to negligible impact. Surrounding commercial activities are focussed on warehousing as opposed to more noise sensitive development such as offices. Accordingly, it is unlikely that existing commercial development will be potentially affected in the short term by construction related noise.

Table 8.8 Construction Noise Sources

Activity	Activity equivalent continuous sound pressure level $L_{Aeq,T}$ @ 10m	Activity equivalent continuous sound pressure level $L_{Aeq,T}$ @ 320m
Site Preparation *Potential Equipment to be Used for Ground Excavation, Foundations, Filling and Trenching*		
Tracked Excavator	83	53
Breaker on Excavator	90	60
Hand-held pneumatic breaker	83	53
Tipper lorry/Placing of rock fill	85	55
Tracked loader	84	54
Tracked excavator and lorry	76	46

Likely Equipment to be used for Tipping/Spreading and Levelling of Ground:		
Dump Truck	82	52
Wheeled Excavator/loader	76	46
Dozer	81	51
Roller	78	48
Compactor	78	48
Building Construction		
Likely Equipment to be Used:		
Truck mixer (discharging)		
Pumping concrete - truck mixer	67	37
Placing concrete and compaction – (combined truck mixer, tracked crane, poker vibrator)	81 86	51 56
Other Potential Noise Sources in Operation at different times:		
Diesel Driven Generator	82	52
Compressor	81	51
Electric percussion drills	78	48
Hand-held petrol driven disc cutter	84	54
Scaffold Poles and Clips	80	50
Site Fork Lift Trucks (idling)	77	47
Diesel Hoist	76	46
Dumper	82	52
Tracked Crane	86	56
Lorry	85	55
Paving Works/ Landscaping		
Tipper lorry	85	55
Roller	80	50
Grader	84	54

8.5.2 Operational Phase

The operational phase can potentially impact on the existing ambient sound environment at the nearest NSLs as follows:

- Increased road traffic and related transportation noise;
- Internal noise breakout from the building through the structure and openings;
- Extraction fan noise breakout through the odour unit stack, and,

Traffic- Related Noise

As a general rule of thumb, a doubling of traffic flow will likely result in a 3 decibel increase in traffic noise levels which is perceptible to the human ear. Chapter 14 of this EIAR deals with the impact of traffic on the local road network and notes that the Proposed Development will result in an additional 44 PCUs on the local road network during peak hour equating to an increase of less than 5% during each of the commuter peak hour. A small number of trucks are expected to collect from or deliver to the facility after 19.00 hrs in the evening. Accordingly, it can be concluded that the Proposed Development will not impact on the ambient sound environment of the area in terms of increased transportation noise.

Internal Noise Breakout from Built Structure

A number of pieces of plant equipment will be used internally. Typical sound power levels supplied by the Developer are as set out in Table 8.9 below:

Table 8.9 Typical Internal Plant

Sources and Corresponding Sound Power Levels (Lw) (dB(A)	
Flexus Baler,	85
C&D & C&I Picking	72
Colmar Baler B300E	80
Powerscreen Trommell 725 LL	99
Skidsteer SC358	80
Komptech MJ5000 Waste Shredder	88
Forklift	78
Excavator	90

Based on the above and from measurements taken at a similar facility, the internal average noise levels are expected to be in the region of 85 dB(A) when all waste handling activities are ongoing including operation of the skip line.

Kingspan KS1000 insulated panels or similar will be used for the exterior walls and roof. The single weighted sound reduction index (SRI) for this material is 25 dB. The material performs well at the higher frequencies with lower sound reduction at lower frequencies e.g. the SRI reduces to 18 dB at 125Hz and increases to 39dB at 4000 Hz.

Measurements taken at a similar facility in January 2017 with a similar built construction and all internal operations ongoing indicate that noise from the facility with the doors closed @approx. 16m will be in the region of 59 dB(A). The $L_{Aeq,15min}$ increased to 66 dB at the same measurement position when the automatic roller doors open intermittently for vehicular intake. Most activities take place indoors.

The nearest NSL to the east is 320m distant therefore, due to distance attenuation alone, it is considered that both the typical and also the lower day, evening and night time noise limits specified in Section 8.4.2 will be complied with. It is not expected that there will be audible tones arising from internal and yard activities associated with the Proposed Development at the nearest NSLs.

Air Handling/Odour Unit

An odour control unit will be installed as part of the Proposed Development. This will comprise of a negative air system that will create negative air pressure within the building whilst utilising fresh air from a number of vents or fresh air intakes on the western, eastern and southern facades of the building and also on the roof. These vents are likely to operate through passive intake of fresh air and will be fitted with louvres. Extraction fans will extract odorous air via a ductwork system with air then passing through a dust filtration system and carbon filtration system before being emitted via the 16m emission vent. The vent will be located at the southern edge of the roof and is not likely to be visible to residential NSLs. No other releases of odour or treated air will occur other than that through the stack. The odour unit including the main noise sources will be contained within the building.

Measurements at a similar unit have been conducted where the unit is located externally. The noise levels were recorded as 73 and 63 dB(A) respectively at 4 and 12m from the unit. Tones were noted at high frequencies however these would be easily attenuated with distance and enclosure as proposed. Due to the intervening distance to the nearest NSLs, it is considered that the proposed odour unit will not impact on the existing ambient sound environment at the nearest NSLs and that both the typical and lower limits will be complied with.

The annual compliance monitoring for a similar operation in Cork has been reviewed. Monitoring at two unscreened locations approx. 40 - 50m distance from the facility indicates that noise from typical activities at both locations were compliant. The distance between NSLs and the Proposed Development will be much greater with some partial screening also. Accordingly, it is not considered likely that existing background noise levels will be exceeded. There will be no significant impact on the existing ambient sound environment at the nearest NSLs.

8.6 Proposed Mitigation and Enhancement Measures

8.6.1 Construction Phase

There is no definitive published Irish guidance relating to the maximum permissible noise level that may be generated during the construction phase of a project. The National Roads Authority has produced guidance for road scheme construction however these developments are linear in nature and therefore different to the current proposal. BS5228:2009 lists applicable noise level thresholds, depending upon existing ambient levels, as described in Table 8.10 below. This table is based upon report E3.2, Table E.1 of BS5228:2009 Part 1.

Table 8.10 Threshold of Significant Effect at Dwellings

Assessment category and threshold value period (L_{Aeq})	Threshold value, in decibels (dB)		
	Category A	Category B	Category C
Night-time (23:00-07:00)	45	50	55
Evening and Weekends	55	60	65
Daytime (07:00-19:00) and Saturday 07:00-13:00)	65	70	75
NOTE 1: A significant effect has been deemed to occur if the total L_{Aeq} noise level, including construction, exceeds the threshold level for the Category appropriate to the ambient noise level. NOTE 2: If the ambient noise level exceeds the threshold values given, in the table (i.e. the ambient noise level is higher than the above values), then a significant effect is deemed to occur if the total L_{Aeq} noise level for the period increases by more than 3dB due to construction activity. NOTE 3 Applied to residential receptors only.			
A) Cat A: Threshold values to use when ambient noise levels (rounded to nearest 5dB) are less than these values B) Cat B: Threshold values to use when ambient noise levels (rounded to the nearest 5dB) are the same as Cat A values C) Cat C: Threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than Cat A values D) 19:00-23:00 weekdays, 13:00-23:00 Saturday and 07:00-23:00 Sunday is deemed 'evening and weekend' period.			

Generally, Category A threshold values can be applied based on the ambient noise levels recorded during the baseline survey. The following mitigation measures will be implemented as good practice:

- A Noise Construction Management Plan will be developed prior to commencement by the successful tenderer. As the construction equipment/process may change subject to the

successful tenderer's proposal, the plan will, where necessary to achieve the threshold values listed in Table 8.10, take account of mitigation measures set out in Section 8 of BS5228: Part 1: 2009 +A1:2014 - Noise Control on Construction and Open Sites. This section identifies measures such as substitution, modification, use of enclosures and siting of equipment in order to minimise impact.

Other general measures to be contained in the plan are as follows:

- Screening of NSLs including any adjacent offices by existing buildings will be used for stationary equipment.
- During the construction phase all equipment will be required to comply with noise limits set out in EC Directive 2000/14/EC and the 2005/88/EC amendment on the approximation of the laws of the Member States relating to the noise emission in the environment by equipment for use outdoors. The directive covers equipment such as compressors, welding generators, excavators, dozers, loaders and dump trucks.
- A site representative will be appointed for matters related to noise and vibration.
- Any complaints received will be thoroughly investigated.
- A written complaints log will be maintained by the site manager. This will at a minimum record the name of the complainant, date and time of the complaint and a record of the details of the complaint including the date and time of when the effect was observed. This will ensure that the concerns of local residents who may be affected by site activities are considered during the management of activities at the site.
- Monitoring of typical levels of noise will be conducted during critical periods at sensitive locations to ensure that excessive levels above the threshold value for daytime are addressed immediately.
- Suitable mitigation measures taken at the time of excessive noise/complaints such as restricting the use of noisy equipment will be taken.

8.6.2 Operational Phase

As set out in Section 8.5.2, onsite activities will not cause excessive noise levels beyond the boundary of the facility. It is not likely that existing ambient sound levels at the nearest residential NSLs will be exceeded. During the operation phase all onsite activity will be carried out in compliance with noise limits and conditions applied as by the Local Authority or EPA when authorising the activity.

Prior to final commissioning of the Proposed Development, it is recommended that a Noise Survey be conducted. This should be undertaken by a competent person and should include monitoring locations at the nearest NSLs. Additional measures will be implemented where necessary before the new plant is fully commissioned.

8.7 Summary & Conclusion

The noise impact assessment for the Proposed Development has been completed through site surveys, desk-based review of compliance monitoring conducted for a similar existing facility and assessment of noise impacts and effects in accordance with recognised standards and guidance. The ambient sound environment in the vicinity of the Proposed Development is typical of an emerging urban/suburban area. The ambient sound environment at the nearest NSLs to the north is dominated by transportation noise although NSLs to the south, east and west are much less affected due to distance and also due to the shape of the island topography. The southern part of Little Island is still quite rural in nature.
Both the construction and operational phases of the Proposed Development have been assessed.

The construction phase is not considered likely to result in a potential impact on the nearest NSLs although typical limits are recommended as set out in BS5228-1:2009 +A1:2014: Code of Practice for Noise and Vibration Control on Construction and Open Sites: Part 1: Noise.

Most of the potentially significant noise sources associated with the Proposed Development including the odour handling unit will be contained within the building. All waste handling and processing will be conducted within the building. There will be some vehicular movements on site however these will be intermittent, typical of the general area and will be screened from the nearest NSLs.

Due to the intervening distance to the nearest NSLs, it is considered that the Proposed Development will not impact on the existing ambient sound environment at the nearest NSLs and that the lower limits for low background areas as set out in NG4 and as follows will be complied with:

Daytime (07:00 to 19:00hrs) – 45dB LAr,T;
Evening (19:00 to 23:00hrs) – 40dB LAr,T;
Night-time (23:00 to 07:00hrs) – 35dB LAeq,T.

The following is also stated in NG4:

During daytime and evening periods rigorous efforts should be made to avoid clearly audible tones and impulsive noise at all sensitive locations. A penalty of 5dB for tonal and/or impulsive elements is to be applied to the daytime and evening measured LAeq,T values to determine the appropriate ***rating level*** *(LAr,T).*
During the night-time period no tonal or impulsive noise from the facility should be clearly audible or measurable at any NSL.
In addition to the foregoing recommended licence limit values, the noise from the licensed facility shall not be so loud, so continuous, so repeated, of such duration or pitch and it should not occur at such times, as to give reasonable grounds for annoyance. In this regard, for contentious cases, an assessment by a competent person will be required.

All reasonably practicable measures should be adopted at licensed facilities to minimise the noise impact of the activity, and BAT should be used in the selection and implementation of appropriate noise mitigation measures and controls.

HGV traffic arising on the local road network as a result of the Proposed Development is considered to be insignificant in terms of noise impact and effect.

Consideration has been given to the proposed development of 75 residential units, creche and associated site infrastructure on the zoned lands adjected to the northern boundary of the site (Planning Ref 18/6021). It is understood that a significant redesign of the proposal in terms of layout, housing numbers and positioning of creche may take place after issue of a request for Further information by the planning department in September 24, 2018. Although the layout is unknown, the perimeter of the proposed housing developing site is approximately 150m from the boundary of the CCR proposal. As noise levels at the proposed CCR waste facility are predicted to comply fully with limit values within a distance of 50m from the site, it is considered that the additional effects of attenuation over distance, together with the screening effects of landscaping will further reduce resultant noise levels to below envisaged limit values.

Overall, it can be concluded that the Proposed Development will not give rise to significant adverse noise related effects on nearby NSLs (current or proposed).

9 Chapter Nine – Air Quality and Odour

9.1 Introduction

The proposed operations will involve the acceptance, sorting, processing (i.e. baling) and dispatching of municipal solid waste along with the acceptance of source separated food waste from household and commercial sources that will be stored temporarily on site before being bulk transported to offsite treatment facilities.

To mitigate against any air or odour pollution emissions from site an air and odour treatment system will be installed in the building to ensure that all emissions to air from waste processing areas within the facility building are extracted and treated before emission via a stack. Detailed information on the proposed air treatment and negative air pressure unit being proposed for the facility is provided in section 4.12 above.

The proposed odour management system is made up of a number of different elements to satisfy the principles of odour control and includes odour containment, odour extraction, capture and treatment. Each element will be installed at the Little Island facility and will be dry and wet commissioned, examined and verified as installed appropriately and adequately.

The air treatment unit will be located and installed within the waste transfer station to enable the required number of air extractions from the building, which are shown on **Drawing 1010** provided in **EIAR Volume III**. The building will be fitted with fast opening doors to enable the required areas to be kept under negative air pressure to prevent fugitive emissions escaping.

9.2 Odour Model

CCR commissioned Odour Monitoring Ireland Ltd. to undertake a review of the odour control system and undertake an assessment of the impact of all atmospheric emissions, including odour. The report on dispersion modelling is included as **Appendix 9.1 in EIAR Vol II.**

As part of the odour assessment, potential odour sources will be identified and used to construct the basis of the modelling assessment. Odour emission rates/fluxes will be calculated from collected olfactometry data gathered from other similar sites and based on industry norms. Odour dispersion modelling will be used to perform an impact assessment and allow comparison with established odour dose response impact criteria. The displaced volumetric airflow rate from the proposed facility building will be calculated using building characteristics and input factors from the Warren Springs model.

9.2.1 Dispersion modelling

Any material discharged into the atmosphere can be carried along by the wind and diluted by wind turbulence, which is always present in the atmosphere. This process has the effect of producing a plume of air that is roughly cone shaped with the apex towards the source and can be mathematically described by the Gaussian equation. Atmospheric dispersion modelling has been applied to the assessment and control of odours for many years, originally using Gaussian form ISCST 3 and more recently utilising advanced boundary-layer physics models such as ADMS and AERMOD (Keddie et al. 1992). Once the odour emission rate from the source is known, (OuE s-1), the impact on the vicinity can be estimated. These models can effectively be used in three different ways: firstly, to assess the dispersion of odours and to correlate with complaints; secondly, in a “reverse” mode, to estimate and

determine the maximum odour emissions which can be permitted from a site in order to prevent odour complaints occurring; and thirdly, to determine which process is contributing greatest to the odour impact and estimate the amount of required abatement to reduce this impact within acceptable levels (McIntyre et al. 2000). In this latter mode, models have been employed for imposing emission limits on industrial processes, odour control systems and intensive agricultural processes (Sheridan et al., 2002). The air dispersion model to be completed for the proposed development will utilise the "reverse mode" to estimate the maximum odour emissions which can be permitted from the Little Island site by the EPA in line with best practice guidance.

9.2.2 Odour impact criterion for waste odours.

Odours from waste handling operations arise mainly from the volatilisation of odourous gases from:

- The surfaces of the received waste;
- Mechanical processing activities within the building;
- Anaerobic decay of organic matter within the waste;
- Storage of waste within the facility buildings for prolonged periods of time, and
- Inefficient odour management and design including loose building fabric, poor facility and door management, inefficient extraction and odour control and external processing and sorting of waste which has been stored for long periods of time.

Any process change which will improve / reduce the nature of the elements above will lead to a reduction in potential odour release. An odour impact criterion defines the odour threshold concentration limit value above baseline in ambient air, which will result in an odour stimulus capable of causing an odour complaint.

There are a number of interlinked factors, which causes a nearby receptor (i.e. resident) to complain. These include:

- Odour threshold concentration, odour intensity and hedonic tone-defined measurable parameters at odour source;
- Frequency of odour-how frequently the odour is present at the receptor location;
- Duration of odour-how long the odour persists at the receptor location, and
- Physiological-previous experiences encountered by receptor, etc.

9.2.3 Dispersion Modelling Inputs

Dispersion modelling allows for an assessment of proposed changes in processes within the facility without actually having to wait for the processes to be changed (i.e. predictive analysis) or the impacts to have occurred. Impacts from the facility operations were assessed in accordance with the following requirements. These include:

- AG4 - Air Dispersion Modelling from Industrial Installations Guidance Note (AG4), EPA 2010
- H4 Odour Management, Guidance Parts 1 and 2, Environment agency, UK, 2011.
- EN13275:2003 - Air quality - Determination of odour concentration by dynamic olfactometry, (CEN), 2003.

Based on these publications, a limit value of less than 1.5 OuE/m^3 (98^{th} %-ile of hourly averages for 5 years of screened hourly sequential meteorological data) was used in determining the significance of potential odour impact.

Five years of hourly sequential meteorological data from the Met Eireann Meterological Station at Cork Airoporrk (2011 – 2015 inclusive) Cork was used in the model, with worst case year 2015 used for presentation.

All five years of met data was be screened to provide statistical significant result outputs from the dispersion model. This is in keeping with national and international recommendations on quality assurance in operating dispersion models and will provide a worst-case assessment of predicted ground level concentrations based on the input emission rate data.

Building wake effects will be accounted for in modelling scenarios through the use of the prime algorithm (i.e. all building features located within the facility) as this can have a significant effect on the compound plume dispersion at short distances from the source and can significantly increase Ground Level Concentrations (GLC's) in close proximity to the facility. All building structures and stack heights and orientations will be inputted into the dispersion model in order to allow for wake effects to be taken in to account in the calculations.

9.3 Odour Management and Impacts

The proposed facility's air treatment unit has been designed to achieve an odour level of less than or equal to 1.50 OuE/m3 for the 98th percentile at the nearest receptor. This is standard and evidence of this performance will be provided to the Local Authority/EPA and has been verified through the air quality and odour assessment.

A number of key odour management strategies will be incorporated into the design of the waste recycling facility to include:

The buildings will be constructed to a known specification of an air leakage of less than 3 m3[air]/m2[clad]/hr at 50Pa. The building will be built to this specification and process proved during commissioning. This will ensure that the building fabric will be essentially airtight when the odour control system is in operation.

- All openings where necessary will be fitted with high integrity rapid roller doors which will be interlocked. The doors will be interlocked so as to prevent too large of an opening occurring in the building at any one time.
- The main entry and exit points from the recycling building will be fitted with high efficiency air curtains so as to prevent the egress of odours from open doors during operation. When this is coupled with the negative air extraction system, the egress of odours through open doorways will be prevented during operation.
- The building will be placed under negative pressure using an air extraction system. The air extraction system will remove up to 155,000 m3/hr of air from the building. The air extraction will be focused upon the key odourous areas within the building including the bailed waste storage area and the Food and refuse storage area. This will ensure that if there were breaches in the building fabric integrity, the extraction of air from within this structure will prevent air from leaking from these breaches in the building fabric. In terms of a specification, the building will be fitted with fresh air intake louvers to allow in fresh air in a controlled manner. These louvers will be automatically controlled in terms of their opening size by means of an under-pressure monitoring system which will be fitted to the building. This under pressure monitoring system will continuously monitoring the negative pressure on the building and based on a known set point (typically around –ive 20 to –ive 30 Pa) will control the louver opening size and therefore ensure that the under pressure set point is maintained. An example

of this would be when a door opens: the pressure monitoring system will sense that the door is open as the under pressure on the building will drop as a result of this opening. This in turn will commence the shutting of the louvers and therefore all extraction air will come in through the door so as to prevent odourous escaping out through the door.

- All extracted air will be vented through a self-cleaning dust filtration system to remove dust. This air will then be forced through a carbon filtration system to remove odours from the air. The air will be exhausted through a 16 m vertical stack. Carbon filtration is proven in this area of odour control and is installed on over 10 waste recycling facilities in Ireland.

In conclusion, the proposed plant operations will have negligible impact on the surrounding population with respect to Carbon monoxide, Oxides of nitrogen, Sulphur dioxide, Total particulates and Odours.

The full report on Air Quality and Odour Assessment of the proposed waste facility is included as **Appendix 9.1, EIAR Vol II.**

10 Chapter Ten – Cultural Heritage

10.1 Introduction

This chapter assesses the archaeological, architectural and cultural heritage resource of the proposed Waste Transfer site in Courtstown Industrial Park, Little Island. It sets out the methodology, a baseline of the receiving environment as well as an assessment of the impact of the proposal. Mitigation is proposed for components of the proposal involving construction/excavation works.

10.1.1 Competent Expertise

This chapter of the EIAR was prepared by Dr. Maurice Hurley, a qualified archaeologist with 35 years of experience as a professional archaeologist. Maurice studied archaeology in University College Cork (UCC) having been awarded both a BA and MA in field of archaeology. He was also presented with an Awarded Doctorate of Literature (D.Litt) by the National University of Ireland in 2007 based on published works. He specialises in the Archaeology/Cultural Heritage components of Environmental Impact Assessments and in urban archaeology, where he has particular expertise on the complex interface between development and archaeology in the planning process.

10.2 Methodology

Research has been undertaken in two phases. The first phase comprised a desktop assessment of all available archaeological, historical and cartographic sources. The second phase involved a field inspection of the proposed development area.

The following resources and methods of establishing the archaeological status of the development site were used:

- A desktop study using published archaeological and historical studies and cartographic source;
- Field inspection walkover of the proposed site;
- A review of the Sites and Monuments Record (SMR), the Record of Monuments and Places (RMP) for Co. Cork was consulted for the relevant area;
- All editions of the Ordnance Survey maps were consulted;
- Archaeological, cartographic and historical literature for the area was consulted including previous archaeological work undertaken in the wider area;
- Vertical aerial photographs for the area were examined.

The study involved detailed interrogation of the archaeological and historical background of the Little Island site and surroundings. This assessment focused on the areas of actual proposed development footprint outlined in the redline boundary shown on **Figures 10.1 and 10.2 (EIAR Volume III)** which encapsulates the proposed development.

The background information assessed included information from the Record of Monuments and Places of Cork, the County Development Plan, the topographical files of the National Museum of Ireland, and cartographic and documentary records. Aerial photographs of the study area held by the Ordnance Survey were also consulted. Field inspection was undertaken on 18th November 2015 and on 5th January 2016 in an attempt to identify any known cultural heritage sites and previously unrecorded features, structures and portable finds within the proposed development area.

An impact assessment and a mitigation strategy have been prepared. The impact assessment is undertaken to outline potential adverse impacts that the proposed development may have on the

cultural heritage resource, while the mitigation strategy is designed to avoid, reduce or offset such adverse impacts.

10.3 Background and Scope

This assessment determines, as far as reasonably possible from existing records, the nature of the cultural heritage resource within the area of proposed development using appropriate methods of study. Desk-based assessment is defined as a programme of study of the historic environment within a specified area or site that addresses agreed research and/or conservation objectives. It consists of an analysis of existing written, graphic, photographic and electronic information in order to identify the likely heritage assets, their interests and significance and the character of the study area, including appropriate consideration of the settings of heritage assets (IFA 2012). In order to compile a complete baseline, a site inspection is carried out to complement the results of the desk-based assessment. This leads to the following:

- Determining the presence of known archaeological/ architectural heritage sites that may be affected by the proposed development;
- Assessment of the likelihood of finding previously unrecorded archaeological remains during the construction programme;
- Suggested mitigation measures based upon the results of the above research.

10.4 Consultation

Following the initial research, a number of statutory and voluntary bodies were consulted to gain further insight into the cultural background of the existing and receiving environment and study area, as follows –

- Department of Arts, Heritage and the Gaeltacht – the Heritage Service, National Monuments and Historic Properties Section: Record of Monuments and Places; Sites and Monuments Record; Monuments in State Care Database; Preservation Orders; Register of Historic Monuments and the database of current licences (2014–2015);
- National Museum of Ireland, Irish Antiquities Division: topographical files of Ireland;
- National Inventory of Architectural Heritage: County Cork;
- Trinity College Dublin, Map Library: Historical and Ordnance Survey Maps;
- Mary Sleeman, Cork County Archaeologist (20 November 2015).

10.5 Baseline Description of Existing Conditions

10.5.1 The Receiving Environment

The proposed development is located on the eastern side of Little Island and on the western side of the currently developed units of Harbour Point Business Park. The site is currently a greenfield site **(Plates 1 – 4, EIAR Volume II: Appendix 10.1)**, and is bounded to the west by a now abandoned golf course, to the north by agricultural land, to the south an area that has laid out to accommodate industrial units, some of which have already been built with access from a service spur road. The eastern side is flanked by industrial units which line both sides of the Business Park main road.

The site under review is currently a field in rough pasture **(Plates 1 – 2, EIAR Volume II: Appendix 10.1)**. The topography is a slope from east to west **(Plates 1 – 3, EIAR Appendix 10.1)**, from approximately 22.5m OD to 27.5m OD, the northwest corner being the highest point and the southeast

corner the lowest. The field pattern in the area is one of rectangular fields with no apparent anomalies in the general pattern.

A site to the southeast has already been cleared for a proposed development **(Plate 4, Appendix 10.1)**, 'area under construction'. The soil profile apparent at the perimeter of the cleared ground indicated uniform shallow topsoil over a stony subsoil with rock running close to the surface. This adjacent site offers an indication of what might be termed a typical likely soil profile of the site under review.

10.5.2 Archaeological and Historical Background

The townland of Courtstown is located on Little Island, a parish and island, in the Barony of Barrymore. The name Little Island appears to have been Inis Meic Neil in modern Irish, the Gaelic name of Inse Ratha was used from the end of the 19th century until it was officially replaced in 1975.

Originally two separate islands formed Little Island known as Inis MhicNeill and Inis Iarthair. The first land-link onto Little Island from the mainland was probably some type of ford or crossing during the eighteenth century at Rockgrove and Castleview, this location is likely to have been in the place where the Island Bridge was subsequently constructed. This point was the narrowest location between the high ground of Castleview and Rockgrove Demesne. Once the bridge was built, Little Island was no longer an island.

The Bury family reclaimed the marshland between Inchera and Inse Ratha in around 1820. This is the strip of ground at the western end of Little Island and south of both Inchera and Bury's bridges. This reclamation probably facilitated the erection of the bridge, and subsequent causeway at Bury's Bridge. This meant it was now possible to traverse the whole of Little Island, including Inchera by land.

Since the 1990s, Little Island has become a centre of commercial development in the Cork region; many of Cork's pharmaceutical companies are based there. The main sewage treatment plant for Cork City, opened in 2004, is located on the southern tip of Little Island. An amenity area of 17 hectares surrounds the plant including a two-and-a-half-mile public coastal walkway.

10.5.3 Summary of Previous Archaeological Investigations

While there is no record of archaeological investigation taking place on the site under review, archaeological testing and monitoring has taken place nearby and those closest to the site under review are presented in summary below.

- In 2001 topsoil monitoring of a 15-hectare greenfield site at Carrigrenan, Little Island approximately 1km to the south of the site under review, prior to the construction of the waste water treatment plant for Cork Main Drainage, exposed extensive shell spreads along the western perimeter of the site above the shoreline. The following year the area was subject to archaeological testing which concluded that there was 'no evidence of human activity and the position and nature of the stratified material suggest that these layers were laid down naturally' (Lane. S, Licence No. 01E0868, in Bennett. I (ed) 'Excavations 2001' p.34).
- Archaeological monitoring took place c. 1km to the south of the site under review in 2004 'in and around the southern portion of Little Island' (Dunne, L. Licence No. 04E0275, www.excavations.ie), and concluded that 'no archaeological features or artefacts were recorded during monitoring'.
- In 2006, Ms D. Sutton undertook a series of archaeological testing (Licence No. 06E0728) within the Zone of Archaeological potential for the site of Courtstown Castle (RMP CO075-025) lying at a distance of c. 800m east of the site under review (this is the nearest Recorded Monument to

the site under review). The testing did not reveal anything of archaeological significance. Some oyster and periwinkle shells, fragments of animal bone and post medieval pottery were noted in the topsoil layer of one trench and 'several sherds of post-medieval pottery' were found when the soil from the trenches was spread and examined.

The occurrence of shell and pottery in the topsoil is to be expected in an area close to the sea and human habitation; sand, farm manure and domestic cess were routinely spread on the land to improve its fertility in areas where such materials were readily available and accessible.

10.5.4 Field Inspection

The field inspection sought to assess the proposed development site, its previous and current land use, the topography and whether any areas or sites of archaeological potential were present. During the course of the field investigation the proposed development site and its surrounding environs were inspected for known or previously unknown archaeological sites. The proposed site was examined by field-walking in November 2016. The site inspection included a photographic survey and examination of the monuments in the vicinity.

There is no known Recorded Monument within the boundary of the development site or in the immediate vicinity **(Figures 10.1 – 10.4, EIAR Volume III)** but some archaeological sites occur in the wider environs. The Recorded Monument sites are shown on **Figures 10.1 & 10.2 (EIAR Volume III)**.

The description of each site provided in Table 10.1 below is derived from the Sites and Monuments Record (SMR) files held by the Department of Arts, Heritage & Gaeltacht and the 'Archaeological Inventory of County Cork. Volume 2: East and South Cork' Dublin Stationary Office, 1994).

Table 10.1 Sites and Monuments Record (SMR) descriptions of relevant features

Reference Number	**CO075-025**
Monument Type	Castle-unclassified
Townland	Courtstown
County	Cork
Description	On top of a natural knoll, in commanding position at east end of Little Island. Marked 'site of' on 1842 OS 6-inch map; no visible surface trace. Barry castle, the name 'court' may indicate a 17th century date of construction.
Distance to site boundary	800m to the northeast

Reference Number	**CO075-024001**
Monument Type	Midden
Townland	Carrigrenan
County	Cork
Description	On shoreline at Little Island. Spread of shells extends for 66m along shoreline is 0.10m deep and 2m wide but possible extends landwards under grass cover.
Distance to site boundary	1.1km to the southwest

Reference Number	**CO075-024002**
Monument Type	Designed landscape-belvedere
Townland	Carrigrenan
County	Cork
Distance to site boundary	1km to the southwest

Reference Number	**CO075-046**
Monument Type	Folly
Townland	Foaty
County	Cork
Description	Detached irregular-plan multiple-bay two-storey folly, built c. 1820, comprising central rectangular-plan three-bay two-storey block with square-plan single-bay two-storey block to north-east elevation and paired circular-profile three-stage towers to south-west elevation, that to north taller. Now disused. Flat roofs with carved limestone machicolated eaves, carved limestone crenellations and machicolations to towers. Random rubble limestone walls with cruciform recesses with chamfered limestone surrounds. Square-headed window openings with carved limestone label mouldings and chamfered limestone surrounds. Tudor-arched carriage-arch opening to north-east block with carved limestone surround. Tudor-arched door opening to central block with carved limestone surround. Carved timber spiral staircase to interior of east tower. Cut limestone quay walls and loading dock to west
Distance to site boundary	1.2km to the southeast (across the channel)

The National Inventory of Architectural Heritage (NIAH) does not list any building on or close the site as being of architectural value. The nearest building recorded as having architectural merit is a detached four-bay single storey house (Reg. No 20907533) situated approximately 0.5km to the northwest of the site under review **(Figure 10.4, EIAR Volume III)**.

The Recorded Monument CO075-046, Folly (see above) is also listed in the National Inventory of Architectural Heritage (Reg. No. 20907766) with a Regional rating, this lies 1.2km from the site of the proposed development **(Figure 10.3, EIAR Volume III)**.

10.6 Assessment of Impacts (Construction and Operational)

10.6.1 Construction Phase

As there is no Recorded Monument on the site, no specific evidence for archaeological material apparent on the ground and no reason to assume that such exists (more or less than any other area of ground) then there are no grounds to suggest that the site contains any archaeological resource. Extensive archaeological works in the area have not revealed evidence for archaeological material. Much of the area in the vicinity of the site under review has been greatly altered by the construction of modern buildings (Harbour Point Business Park). The chance however, always exists that hitherto

unknown or unpredictable archaeological material lies buried beneath the surface. As the proposal involves the reduction of ground level of depths between 1m to 3m over most of the site, it is considered appropriate that monitoring of ground preparation by a suitably qualified Archaeologist be undertaken.

10.6.2 Operational Phase

The proposed development will be located within an existing industrial estate and the roof level of the proposal is such as to blend within the existing complex. The required reduction in ground level will contribute to the appropriate setting of the proposal in the landscape and as such the building will not stand out from the overall context of the business park.

10.7 Proposed Mitigation and Enhancement Measures (if applicable)

As there are no anticipated adverse impacts on the archaeological resource of the site, specific mitigations are not considered essential.

10.8 Residual Impacts

There will be no residual impact on the archaeological resource by the proposed development should all of the above mitigation measures be undertaken.

10.9 Cumulative Impacts

No cumulative impact upon the Cultural Heritage resource has been identified as a result of the proposed development.

10.10 Summary and Conclusions

The proposed development comprises the construction of a waste transfer and recycling station, office, ESB sub-station and associated site works including wheel wash and weighbridge at Courtstown, Little Island Co. Cork.

There are no known archaeological monuments within the site boundary and no potential archaeological sites were identified in the course of site inspection. There are no likely physical or visual impacts on any of the known Recorded Monument in the wider vicinity due to the scale of the proposal within an existing industrial landscape. There are no anticipated adverse impacts on the archaeological resource of the site, therefore specific mitigation measures are not considered essential. Risk of inadvertent impact on hitherto unknown buried archaeological material can be mitigated by archaeological monitoring of significant areas of ground disturbance.

All archaeological investigations, including testing and monitoring, should be carried out by a qualified archaeologist under licence to the National Monuments Service and in consultation with the National Museum of Ireland. Full provision should be made for the resolution of any archaeological features/deposits that may be discovered, should that be deemed the appropriate manner in which to proceed. National Monuments Legislation is provided in **Appendix 10.2**.

Once all recommended mitigation measures are undertaken there will be no impact on the archaeological resource during the operational phase of the proposed development.

No cumulative or residual impacts upon the Cultural Heritage resource were identified as a result of the proposed development going ahead.

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Electronic Sources

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www.osiemaps.ie – Ordnance Survey aerial photographs dating to 1995, 2000 & 2005 and 6"/25" OS maps.

www.googleearth.com – Aerial photographs of the proposed development area

http://www.logainm.ie - Placenames Database of Ireland, developed by Fiontar (DCU) and The Placenames Branch (DoAHG).

www.booksulster.com/library/plnm/placenamesC.php - Contains the text from Irish Local Names Explained by P.W Joyce (1870)

11 Chapter Eleven – Population and Human Health

11.1 Introduction

The aim of this chapter is to assess the positive and negative impacts of the proposed development on population and human health with respect to the socio-economic effects and potential adverse effects on human beings arising from environmental impacts, Human beings comprise one of the most important elements in the environment. In carrying out development, one of the principal concerns is that human beings should experience no reduction in the quality of life as a consequence of the construction and occupational phases of a development.

Page 16 of the draft *Advice Notes for Preparing Environmental Impact Statements* produced by the EPA in September 2015 lists a number of issues which may be examined under the topic of Population & Human Health, including the following:

- *Economic Activity likely to lead to projects - will the development stimulate additional development and/or reduce economic activity, and if either, what type, how much and where?*
- *Social Consideration - will the development change the intensity of patterns and types of activity and land use?*
- *Land-use - will there be severance, loss of rights of way or amenities, conflicts, or other changes likely to ultimately to alter the character and use of the surroundings?*
- *Tourism – will the development affect the tourism profile of the area?*
- *Health – have the vectors through which human health impacts could be caused been assessed, including adequate consideration of inter relationships between those assessments?*

These issues are discussed separately and in more detail below in section 11.4.

Publications and other data sources that guided the preparation of this chapter are listed hereunder:

- The Central Statistics Office – data from the 2011 Census; (detailed Census 2016 data was not available at the time of chapter production);
- Cork County Development Plan, 2014;
- Cobh Municipal District Local Area Plan 2017;
- Advice Notes for Preparing Environmental Impact Statements (draft) (EPA, September 2015)
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (draft) (EPA, August 2017)

11.1.1 Competent Expertise

The assessment of human health was completed by David Heelan of OES Consulting. David possesses a BA (hons) from University College Dublin specialising in History and Archaeology and also an MSc. in Regional and Urban Planning from Heriot Watt University, Edinburgh and is a chartered town planner with the Royal Town Planning Institute (RTPI). David has worked as an environmental consultant and town planner since 2008 and has produced human health assessments for a diverse range of developments such as wind farms, roads, bridges, creameries, schools and hydroelectric power plants throughout Ireland and the United Kingdom.

11.2 Receiving Environment

The draft EPA guidelines produced in 2015 indicate that population and human health assessments should describe the receiving environment including the location of sensitive neighbouring occupied

premises likely to be directly affected. The guidelines state that the following should be noted in particular:

- Homes;
- Hospitals;
- Hotels and holiday accommodation;
- Schools and rehabilitation workshops;
- The location of land-uses that particularly depend on the quality of the surrounding environment.

11.2.1 Homes

The nearest residential properties are located 320m to the east and 370m to the north east on Harbour Point Business Park Road and Ballytrasna Park Road respectively as shown on **Figure 1.3, provided in EIAR Volume III**. The eastern boundary of the proposed site is lined by the industrial properties lining Courtstown Park Road whilst the nearest residential properties to the south are those on Clash Road, 450m from the southern boundary of the site. The nearest residential properties to the west are those lining Clash Road, on the western boundary of the now disused Harbour Point Golf Club, 550m to the west.

A planning permission for a residential development comprising 75 houses, creche and all associated site development works has been lodged on lands 150m to the north of the proposed Country Clean Recycling (CCR) waste facility (Planning Ref: 18/6021, Lodged August 1, 2018). The current layout indicates that the closest houses will be approximately 180m-190m from the boundary of the Country Clean lands.

This application is currently (November 8, 2018) the subject of a substantial request for Further Information (RFI), issued by Cork County Council Planning Department on September 24, 2018, which may require a substantial redesign of the proposed housing scheme, both in terms of the numbers and type of dwellings, their position on the site, and distance from boundaries.

11.2.2 Hospitals

There are no regional, national or local hospitals within Little Island or the surrounding areas. The nearest facilities are the Mater Private Hospital Cork approximately 7km to the west by road via the N25 and N40 across Lough Mahon, whilst Cork University Hospital is located 15km by road to the west of Little island.

11.2.3 Hotels and Holiday Accommodation

The primary hotel/holiday accommodation on Little Island is the Radisson Blu Hotel and Spa, located in Castleview, approximately 2 km to the north west of the proposed development site. The hotel is located on the northern boundary of Little Island and possesses excellent access to the N25 Cork to Waterford Road. No other hotels or holiday accommodation within proximity of the proposed development were noted, with Little Island being an industrially zoned part of Cork City.

11.2.4 Schools and Rehabilitation Workshops

Little Island National School is located within the western part of the Island, approximately 2.5 km to the west of the proposed development site. The school is surrounded by both residential properties

and industrial pharmaceutical and plastics facilities. There are no other national or secondary schools within the area surrounding the proposed development site.

11.2.5 Land-uses that particularly depend on the quality of the surrounding environment

The proposed development site and surrounding properties are zoned for industrial purposes, as discussed above in Chapter 3. Little Island is an industrial and business region on the outskirts of Cork City with the primary land use being employment and manufacturing. There are no designated ecological sites or natural heritage areas within or surrounding the proposed development site. As the land use within and surrounding the site is industrial, these sites do not depend on the quality of the surrounding environment to function effectively.

11.3 Population and Settlement Structure

At the time of undertaking this assessment, the detailed results of the annual 2016 census were not available for inclusion. As a result, this assessment has focussed on the information provided in the 2011 census and the documents listed above.

The results of Census 2011 indicate that the population of County Cork has grown to 519,032 persons. Excluding the city, the population of Cork County was 399,802, an increase of just fewer than 37,737 persons compared with the Census 2006 population figures. There was a modest decline in the population of the city over the same period.

The population of County Cork is spread across an extensive range of settlements comprising:

- 26 'main towns';
- 275 villages and smaller settlements; and
- The rural areas.

The main towns and city environs (urbanised areas) together account for 46% of the population of the county in 2011. Table 11.1 describes population levels within Cobh and compares this to County Cork and Cork City urban area.

Table 11.1: Population Levels within Local and County Areas 1996-2011

Town	Population				
	1996	2002	2006	2011	% change between 2006 & 2011
Cork County	293,323	324,767	361,877	399,802	10.4
Cork City	127,187	123,062	119,418	119,230	0.2
Cobh	6,468	9,811	11,303	12,347	9.2

The Cobh Municipal District straddles two Strategic Planning Areas with the majority of the District, and all of the main settlements within the Cork Metropolitan Strategic Planning Area, while part of the more rural northern section of the district including villages like Glenville and Rathduff are within the Greater Cork Ring Strategic Planning Area. Little Island is situated within the Cork Metropolitan Strategic Planning Area.

Cobh has seen strong growth post the 'Celtic Tiger' boom years. The longer-term view of population within Cobh, based on the CSO data, is a modest increase, through the development of a positive settlement pattern over the next decade. Cork as a county is showing positive growth patterns in line

with the county's strong economy and development of agriculture, industry and pharmaceutical employment.

11.3.1 Local Economy and Employment

Table 11.2 describes the breakdown of primary employment classes for County Cork.

Table 11.2 Total Persons aged 15 years and over at work classified by broad industrial group - County Cork

Industrial Group	Cork City and County
Agriculture, forestry and fishing	12,529
Manufacturing	28,969
Construction	10,786
Wholesale and Retail	30,131
Transportation and Storage	7,856
Accommodation and Food Service	11,613
Information and communication	6,526
Financial and insurance	6,364
Professional, Scientific and Technical	10,433
Administrative	7,287
Public Administration	10,980
Education	18,949
Human Health and social work	22,734
Arts and entertainment	3,059
Industry not stated	10,900
Total	**199,116**

[3]

In the census, unemployment is measured on a Principal Economic Status basis and the results in Ireland Part 2 showed an overall unemployment rate of 19%. However, there were over 82,000 people aged 15-24 out of work in April 2011 up from 47,122 in 2006, resulting in an unemployment rate for this age group of 39%. Among males in this group the numbers rose from 26,448 to 50,440 over the five years giving an unemployment rate of 45%. For females, the numbers out of work increased from 20,674 to 31,713 giving an unemployment rate of 32%.

Nationally Limerick City and Donegal had the highest levels of youth unemployment with rates of 50% and 49% in 2011 respectively, in effect half of all young people in the labour force. The lowest rate was 27% in Dún Laoghaire-Rathdown. Fingal, Cork County and Galway City were also at the lower end of the youth unemployment spectrum.

11.4 Impacts of the Proposed Development on the Local Economy and Employment

The 2015 EPA Guidelines discussed above in section 11.1 ask the question whether the proposed development will stimulate additional development and/or reduce economic activity

A waste transfer and recycling facility was awarded planning permission on the proposed development site in January 2008. The proposed development seeks to increase the levels of activity which were previously granted and is ideally located in an industrially zoned site within a wider strategic employment area, integrating well with the surrounding similar land uses. The proposed development

[3] *Source: Census 2011 Profile 3 At Work - Employment, Occupations and Industry*

is expected to be a long term and steady employer within Little Island due to the existing need for the type of resource which is supported by the Cork Waste Management Plan. The proposed development will provide staff numbers of between 20-30 staff. Additional downstream employment will also be required through truck drivers, external maintenance contractors (painters, decorators), mechanics and the service industry, both for the company and from additional staff accessing local fuel stations and food suppliers. The proposed development will aid surrounding businesses by providing a local waste recycling and reduction resource which will reduce waste transport and disposal costs for local businesses. The proposed waste transfer and recycling station will not result in negative impacts on local businesses in relation to operating ability, traffic levels or environmental impacts such as air quality and noise and will provide a long term sustainable waste resource for Little Island

11.5 Impacts of the Proposed Development on Population and Human Health receptors

11.5.1 Social Consideration? Will the development change the intensity of patterns and types of activity and landuse

The proposed development complies with the industrial land use for the site as outlined in Chapter 3 above with a similar development for a waste transfer and recycling facility permitted on the site in 2008. The proposed development integrates well into the industrial and employment land zonings within Little Island and Harbour Point Business Park and will provide a much needed waste reduction and recycling facility within this part of Cork City which can be easily accessed and utilised by surrounding businesses.

The proposed development has been designed to fully reflect the aspirations for the site outlined in the Cobh Municipal District Local Area Plan through Site Objective LI-I-02:

"Industrial Estate and/ or warehousing and distribution with provision for local access road. Minimum 20 – meter wide tree planted buffer along northern and western boundary of site. 20- meter wide".

The proposed development integrates and aligns with existing surrounding land uses within Harbour Point Business Park and reflects the patterns and intensity of development which surrounds the proposed site. A 20m wide buffer of tree planting is proposed along the western boundary of the site as shown on **Drawing 1001, EIAR Volume III** to comply with Site Objective LI-I-02.

11.5.2 Land-use - will there be severance, loss of rights of way or amenities, conflicts, or other changes likely to ultimately to alter the character and use of the surroundings?

There are no recorded or listed public rights of way within or surrounding the proposed development site. As noted below in Chapter 12, the proposed development will not incur any significant impacts in respect of local landscape character or sensitive visual receptors in the environs of the site, i.e. local or distant residents or users of the surrounding road network infrastructure. The landscape and visual assessment concluded that the absence of adverse impacts reflects the manner in which the proposed development will be integrated among similar developments on the business park and the mitigating effect of distance in views from residential areas and the road network around the harbour. The proposed facility will not alter the character and use of the site surroundings as a strategic employment area founded on industrial land usage and will not result in adverse impacts on neighbouring businesses or indeed local residents located further out from the site boundaries as shown on **Figure 1.3, EIAR Volume III**. In addition to the absence of landscape and visual impacts, the proposed development will not result in adverse impacts on local residents in relation to noise, air quality and odour and traffic. Amenity users such as visitors and local residents enjoying garden spaces, open windows and the general environs of Little Island will not be negatively impacted by the proposed

development with no decrease in amenity enjoyment. The proposed 20 m tree buffer on the western boundary will further isolate the waste transfer and recycling facility from any future residential development in the west and northern section of the former Harbour Point Golf Club to the west, ensuring no conflict with development aspirations for the site listed in the Cobh Municipal District Area Local Plan.

11.5.3 Tourism – will the development affect the tourism profile of the area?

The proposed development is not located within or in close proximity to a tourist attraction and will not impact on local tourist facilities such as the Radisson Blu Hotel, 2 km to the north west. The development will not result in adverse impacts on local residents or visitors to the area in relation to amenity, the enjoyment of outdoor spaces, visual scenery and noise. Views across Lough Mahon will not be significantly impacted by the proposed development as it will seamlessly integrate into the existing industrial background and has been designed to reflect existing building heights and finishes of the surrounding industrial and business properties.

11.5.4 Health – have the vectors through which human health impacts could be caused been assessed, including adequate consideration of inter relationships between those assessments?

Noise

The noise assessment completed as part of this EIAR discussed in detail in Chapter 8 concluded that the proposed development will not give rise to significant adverse noise related effects on nearby noise sensitive locations.

Operation of the Little Island waste facility will result in new noise sources becoming operational in the Courtstown Industrial Park. However, the limits and conditions of the waste license will be complied with at a minimum. The facility is not located in a quiet area or area of low background noise levels. Therefore, the effect is not deemed to be significant. Traffic arising on the local road network as a result of the proposed development is not considered to be significant in terms of noise impact and effect.

The noise assessment concluded that the proposed development will not result in significant adverse impacts on local commercial properties and surrounding residents. As a result, noise related impacts of the proposed development on human health was determined as not significant.

Air Quality, Odour and Dust

A detailed air quality assessment has been undertaken to determine the impact on local air quality resulting from the operation of the proposed Little Island waste facility site in terms of emissions to air.

Operations at the facility will not be permitted to commence until the formal waste permit or licence is provided to CCR.

The determination of the waste permit /licence will include a consideration of the air quality, odour and dust impacts of the proposed development and a formal permit/ licence will include a schedule of emission limits which the facility must operate within, with a requirement to monitor and record site performance each year as part of the annual environmental report for the site which is submitted in relation to compliance.

As mentioned in Chapters 4 and 9 above, the facility and operational processes have been designed to prevent air quality and odour impacts and emissions occurring at the site. All waste processing, sorting and baling will be undertaken within the facility building itself, with a negative air pressure and an odour extraction and treatment unit operating within the building. Storage of waste materials outside of the building will not occur, further reducing the potential for odour emissions from waste on site.

Based on the output of dispersion modelling undertaken for the proposal, the potential for significant adverse impact on local air quality or generate adverse odours is regarded as minimal and not significant. Therefore the proposal will not impact on the health of the local population within Little Island and the surrounding area.

Amenity

As mentioned above in section 11.5.2, the proposed development will not impact on the potential for local residents and visitors to Little Island to enjoy the amenity and outdoor spaces of the area. As noted below in Chapter 12, the proposed development will not incur any significant impacts in respect of local landscape character or sensitive visual receptors in the environs of the site. In addition to the absence of landscape and visual impacts, the proposed development will not result in adverse impacts on local residents and works in relation to noise, air quality and odour and traffic and will not reduce amenity enjoyment within Little Island.

Water

The proposed development will not impact on the quality of public water supplies or place an under pressure on the supply of local drinking water. There are no rivers or streams on the development site and any local field drains will be protected during the construction and operation of the proposed facility.

Traffic

The transportation assessment provided in Chapter 14 below demonstrates that the proposed development will have an unnoticeable impact upon the established local traffic conditions and can easily be accommodated on the road network, conscious of the established busy conditions within Little Island generally. The addition of a total of 44 Car Equivalent (worst case) movements during the peak hour is considered to have a negligible effect. The study assessed the capacity of the key junctions using proprietary modelling tools and confirmed that adequate capacity exists.

11.6 Mitigation Measures

11.6.1 Noise

CCR has included a number of project design features to minimise potential noise emissions at the facility including the following:

- A Noise Construction Management Plan will be developed prior to commencement by the successful tenderer;
- During the construction phase all equipment will be required to comply with noise limits set out in EC Directive 2000/14/EC and the 2005/88/EC amendment on the approximation of the laws of the Member States relating to the noise emission in the environment by equipment for use outdoors. The directive covers equipment such as compressors, welding generators, excavators, dozers, loaders and dump trucks;

- A site representative will be appointed for matters related to noise and vibration and any complaints received will be thoroughly investigated.
- Prior to final commissioning of the Proposed Development a Noise Survey be conducte, and
- All waste processing, sorting and baling will take place within the facility building itself with attenuation provided by building walls. No such operations will take place outdoors. Facility building doors will be rapid/open close to further reduce the potential for noise emissions form internal spaces.

11.6.2 Air Quality

a) Odour

To mitigate against the presence of odours on-site CCR proposes to install an odour abatement system. The air and odour treatment system will be a Simdean Envirotec designed air pollution and odour control system with custom-designed tanks and process vessels in a range of corrosion resistant materials. Simdean Envirotec has a track record of coming up with innovative technical solutions to difficult odour control and waste elimination problems and there units have been installed in a number of EPA licenced Waste Transfer Stations in Ireland. Additionally, CCR will implement operational procedures to further reduce the odour emissions from the site. These are listed below:

- All waste loads will be examined on the waste transfer building floor to assess the nature of the load and determine if putrescible waste is present.
- Once detected, putrescible waste will be loaded into the transfer trailers as soon as possible so it can be removed off-site.
- The frequency of collection of putrescible loads will be increased to minimise the odours emitted from these loads when tipped on the floor of the transfer station.
- If a load arrives on-site generating significant odours it will be removed immediately from the facility. In addition, the odour neutralising system is switched on manually to counteract these odours.
- If customers continue to send such loads to the facility they are advised that the waste will no longer be transferred through the Transfer Station

Detailed assessment of the operation of the proposed odour abatement system is presented in **Appendix 9.1, EIAR Volume II.**

b) Dust

To minimise the levels of dust emanating from the facility CCR will take the following measures:

- The site will be swept regularly using a road sweeper with wetting capabilities.
- Interlocking fast opening doors will be installed at the doors of the waste transfer building to further reduce the dispersion of any odours from the facility.
- Detailed mitigation measures in relation to dust reduction during the construction phase of the facility is provided within the CEMP, **Appendix 6.3, EIAR Volume II**.

11.6.3 Amenity

In addition to the proposed mitigation measures designed into the project to reduce the potential for noise and air emissions from the facility, CCR has sought to minimise the impact of the project on the local visual landscape and the existing views enjoyed by local residents. A similar waste transfer building with a height of 14.5m was permitted on the site. However, after competing initial site designs

for the development proposed as art of this application, John realised that a reduction in height of the building to 12.8m could be achieved whilst maintaining sufficient capacity space within the building for operations. The landscape and visual assessment completed below in chapter 12 determined that the proposed building (including the reduced roof height) will not incur any significant impacts in respect of local landscape character or sensitive visual receptors in the environs of the site, i.e. local or distant residents or users of the surrounding road network infrastructure.

The absence of adverse impacts reflects the manner in which the proposed development will be integrated among similar developments on the business park, and the mitigating effect of distance in views from residential areas and the road network around the harbour.

To fully comply with the Cork County Council objectives for the future development of the facility site and to minimise visual impacts for local residents such as those living on Clash Road to the west and south, CCR proposes to develop a number of mitigation measures within the site boundary. A 20m tree planted buffer will be planted with native tree and hedgerow species to augment existing retained vegetation along the western boundary of the site as shown on **Drawings 1001** and **1026, EIAR Volume III** which will include an earthen embankment lining the eastern edge of the trees to differentiate and safeguard this natural area from the rest of the site. Existing vegetation lining the northern boundary will be cut back locally and maintained to ensure natural buffers remain onsite. These measures will further reduce the visual impact of the proposed development and ensure, as concluded in Chapter 12 below, that the proposed development will not incur any significant impacts in respect of local landscape character or sensitive visual receptors in the environs of the site

11.6.4 Water

There are no natural watercourses including rivers or streams flowing within or close to the proposed development site. Local drainage channels such as that along the northern boundary of the site on the site will be protected and maintained during the construction and operation of the proposed development with development buffers being implemented to ensure no impacts occur. Groundwater abstraction is not proposed as part of the proposed development and, as discussed above in Chapter 4, the proposed facility will utilise approximately $10m^3$ per day which will not result in undue pressure on local water supplies.

11.6.5 Traffic

The following mitigation measures are proposed by CCR to reduce the impacts of the operations on traffic:

- Continual servicing of vehicles;
- Covering of all vehicles entering and leaving the site;
- Maximisation of the use of the existing N25 ring road around Cork City.

11.7 Summary and Conclusions

The primary aspects of the development and environmental factors that can have the potential impact on the populations and human health are discussed above. It is concluded that there will be no adverse impact on human health.

12 Chapter Twelve – Landscape

12.1 Introduction

This chapter deals with landscape and visual impact assessment (LVIA) examining potential effects of the proposed development on the landscape setting as well as on visual receptors in the landscape such as residents, visitors, people pursuing recreational activities etc. The assessment indicates the level of anticipated impact and outlines measures by which impacts can be mitigated.

Tables and maps referred to in the text are embedded within the Chapter.

12.1.1 Competent Expertise

This section of the EIAR was prepared by Cunnane Stratton Reynolds, landscape architects. It has been informed by a detailed survey of the site and the surrounding receiving environment carried out by a senior and experienced landscape architect who is a full member of the Irish Landscape Institute (I.L.I.) and a chartered member of the Landscape Institute (U.K.).

12.1 Consultation

No consultation other than with the design team was required in the preparation of this report.

12.2 Methodology

12.2.1 Desk Based Assessment

A desk top review of planning policy affecting the site was undertaken and the following documents were reviewed:-

- Cork County Council Development Plan 2014-2020
- Blarney Electoral Area Local Area Plan, Second Edition, January 2015
- Cobh Draft Municipal District Local Area Plan (at time of writing)

A summary of relevant policies contained in the above plans is as follows:-

> *Blarney Electoral Area Local Area Plan 2011 Volume 1*
> *4 Little Island*
>
> *Strategic Context*
>
> *4.1.1 In the Cork County Council Development Plan 2009, Little Island was designated as a Strategic Employment Centre. The strategic aims for Little Island reaffirm it as a strategic centre of general business development serving both the Blarney Electoral Area and the wider Metropolitan area.*
>
> *4.2.3 In relation to future population growth, neither the Cork County Development Plan 2009 nor the CASP Update 2008 envisaged any significant population increase in Little Island. While the Local Area Plan, will not provide for additional growth, there is a need to ensure that the amenity and quality of life experienced by the residents will not be compromised by development of little Island as a strategic employment centre.*

4.2.5 In recent years, there has been a move away from this traditional manufacturing base towards more distribution and logistical type developments on the eastern end of Little Island and office-based developments in Eastgate.

Environment

Landscape and Visual Amenity

4.2.21 The County Development Plan 2009 addresses the landscape of the County with reference to 16 defined landscape types that were derived from a study of the 76 smaller landscape character areas. Little Island lies within Cork Harbour and Estuary Landscape Character Area, an area of very high landscape value and sensitivity. The Cork County Draft Landscape Strategy has suggested that this area is of national landscape importance.

Special Protection Area

4.2.22 There is one SPA, Cork Harbour, which lies to the north and east of Little Island. The harbour itself is of major ornithological significance, being of international importance both for the total numbers of wintering birds, over 20,000. In addition, there are at least 15 wintering species that have populations of national importance. Cork Harbour is also a nationally important breeding colony of the Common Tern.

Candidate Special Area of Conservation

4.2.23. There is one Special Area of Conservation located to the East of Little Island, the Great Island Channel (cSAC 1058). The area is an integral part of Cork Harbour which is a wetland of international importance for the birds it supports.

Proposed National Heritage Areas

4.2.24. Rockfarm Quarry on Little Island has been designated a proposed Natural Heritage Area. The limestone region is of international importance because of its geological characteristics and because it is a seasonal home to a number of migrating bird species.

Protected Structures

4.2.25. There are 4 protected structures on Little Island, Wallingstown Tower House (RPS no 00491). Little Island Church (in ruins, RPS no 00495), the lodge (RPS no 00501) and Ditchley House (RPS no 00502)

4.2.26. It is an objective of the county Development Plan 2009 (ENV 1-5) ''to provide protection to all Natural Heritage sites designated or proposed for designation in accordance with National and European legislation''.

4.3 PROBLEMS AND OPPORTUNITIES

Availability of Business Land

4.3.1. According to the Business Land Availability Study (BLAS) 2009, there were 16 hectares of land zoned for general business development in Little Island. Given past growth rates, this land will be exhausted in 5 to 6 years. If Little Island is to continue to function as a strategic employment centre, serving the wider Metropolitan Cork Area, the BLAS recommended that additional lands will need to be provided.

4.3.2. The most appropriate means of providing this additional land will be by encouraging the redevelopment of brownfield sites particularly on the western side of the island.

Open Space and Recreation
4.4.8. Little Island has a number of facilities that make an important contribution to sports and recreation provision in the metropolitan area as a whole. These areas have been designated open space in order to protect them from inappropriate development.

4.4.9. The eastern part of the island is close to Fota Island where there are important leisure and cultural facilities. In order to protect the views and prospects at this point, land at the eastern end of the island has been made the subject of a specific objective.

SPECIFIC DEVELOPMENT PLAN OBJECTIVES FOR LITTLE ISLAND

LI-I-02 (Prosed development site)
Industrial estate and /or warehousing and distribution with provision for local access road. Minimum 20-metre-wide tree planted buffer along the northern and western boundary of the site. This area is known to be an important feeding location for a number of species of bird for which the Cork Harbour SPA is designated (including Oystercatcher, Curlew and Black-tailed Godwit). Consideration of implications for theses species will be integral to the assessment of new development proposals for this area. It may be necessary to retain a portion of this zone as undeveloped land to ensure that sufficient undisturbed field feeding habitat remains available to maintain the favourable conservation status of populations of these species.

LI-X-01 (Site located to the west of the proposed development site)
Mixed use development including provision of:
a) Appropriate uses on-site, including primarily business uses but also a hotel and significant open space;
b) The link road LI-U-O2, as identified on the land use zoning map;
c) A detailed public transport strategy that will address improvements to the pedestrian and cycling facilities;
d) Accessible public open space amounting to 8.9ha (22 acres)

LI-X-21 (Site located to the north-west of the proposed development site)
Medium B density residential development up to a maximum of 250 dwelling units incorporating a landscape buffer between residential units and other site uses.

12.2.2 Site Based Assessment

The proposed development site and environs were visited as part of the landscape and visual impact assessment during the autumn of 2016. The purpose of the site visit was to gain a thorough understanding of the character of the site and locality and to determine the location of visual receptors in the area who could be potentially affected by the proposed development.

The nature of potential mitigation measures appropriate to the setting was also be informed by the site visit.

12.2.3 LVIA Guidelines – Values and Significance Criteria

This Landscape and Visual Impact Assessment (LVIA) is in accordance with the EPA's *Guidelines on the Information to be contained in Environmental Impact Statements,* 2002*,* and the Landscape Institute (UK) *Guidelines for Landscape and Visual Impact Assessment,* Second Edition 2002, (the Guidelines) from which the methodology is derived*.*

The following sources were also consulted:

- Department of the Environment and Local Government's Draft Landscape and Landscape Assessment Guidelines.
- Cork County Development Plan 2014 – 2020
- Cobh Municipal District Local Area Plan

The EPA guidelines suggest that impacts should be assessed by reference to an existing acknowledged standard require clarity and a systematic approach to the description of impacts - Character (Positive, Neutral or Negative), Magnitude, Significance, Duration.

The Guidelines (Landscape Institute) prescribe that landscape and visual impacts be assessed by separate, although linked procedures. Landscape assessment considers the effects deriving from alterations to the elements and characteristics of the landscape, which may give rise to changes in its character, how it is experienced and hence the ascribed value of the landscape. The landscape is often described as "townscape". Visual assessment is concerned with changes that arise in the composition of available views, the response of people to these changes and the overall effects on the area's visual amenity. Visual change is the alteration to a view, visual impact is the assessment of the significance of that change.

12.2.4 Landscape Impacts:

The potential landscape impact assessment is based on:

The sensitivity of the landscape resource, which is a function of its land use, landscape / townscape patterns and scale, visual enclosure and distribution of visual receptors, and the value placed on the landscape.

The landscape sensitivity is classified as:

- high (exhibits a very strong positive character with valued elements and characteristics that combine to give an experience of unity, richness and harmony, therefore particularly sensitive to change in general),
- medium (exhibits positive character but has evidence of alteration to / degradation / erosion of elements and characteristics resulting in an area of mixed character, therefore potentially sensitive to change in general, or
- low (exhibits generally negative character with few valued elements or characteristics), and;

The scale or magnitude of landscape effects or the quantity of change to be imposed on the landscape by the development:

The magnitude of change to the landscape is classified as:

- high (total loss of or major alteration to the key elements or characteristics of the landscape/townscape, and / or introduction of elements considered totally uncharacteristic in the context of the receiving environment's landscape/townscape character),
- medium (partial loss of or alteration to one or more key elements or features, and / or introduction of elements that may be prominent but may not necessarily be considered to be substantially uncharacteristic in the context of the receiving environment),
- low (minor loss of or alteration to one or more key elements or characteristics, and / or introduction of elements that may not be uncharacteristic in the context), or
- negligible (very minor loss, alteration or introduction of elements of the landscape).

12.2.5 Visual Impacts

The potential visual impact assessment describes the changes in the character of the available views and the changes in the visual amenity of the visual receptors for a number of places / viewpoints selected to represent the receiving environment and its users. The potential visual impact on each viewpoint is assessed based on:

The sensitivity of the visual receptors, which is a function of the location and context of the viewpoint, the expectations and occupation or activity of the receptor, and the importance of the view.
Viewpoint sensitivity is classified as:

- high (e.g. users of outdoor recreation facilities or centres of activity focused on the landscape, and occupiers of residential properties with views affected by the development),
- medium (e.g. people travelling through or past the affected landscape in cars or on public transport, i.e. viewing but not focused on the landscape), or
- low (e.g. people at their place of work or engaged in similar activities such as shopping, etc., whose attention will be focused on these activities).

The scale or magnitude of visual effects or the degree / quantity of change to the field of view (towards the site) resulting from the development. This takes into account the extent of the view that would be occupied by the intrusion, e.g. full, partial, glimpse, etc. including the distance of the viewpoint from the development and its effect on the importance of the development in the field of view, the proportion of the development or particular features that would be visible, and whether the view of the development would be static, or a sequence or transient (as seen from a moving vehicle).

The magnitude of change to each view is classified as:

- high (total loss of or major alteration to the key elements or characteristics of the view, and / or introduction of elements considered totally uncharacteristic in the context of the view),
- medium (partial loss of or alteration to one or more key elements or features, and / or introduction of elements that may be prominent but may not necessarily be considered to be substantially uncharacteristic in the context of the view),
- low (minor loss of or alteration to one or more key elements or characteristics, and / or introduction of elements that may not be uncharacteristic in the context), or
- negligible (very minor loss, alteration or introduction of elements of the view).

The significance of the impacts (both landscape and visual) is determined based on the measurement of the magnitude of change against the sensitivity to change:

Table 12.1 - Assessment / Grading of Impact Significance

		Sensitivity			
		High	Medium	Low	
Magnitude	High				High Significance
	Medium				Medium Significance
	Low				Low Significance
	Negligible				

The predicted impacts are also classified as beneficial, neutral or adverse. This is not an absolute exercise; in particular, visual receptors' attitudes to development, and thus their response to the impact of a development, will vary. However, the methodology applied is designed to provide robust justification for the conclusions drawn.

These qualitative impacts are defined as:

Adverse – Scheme at variance with landform, scale, pattern. Would degrade, diminish or destroy the integrity of valued features, elements or their setting or cause the quality of the landscape (townscape)/view to be diminished.

Neutral – Scheme complements the scale, landform and pattern of the landscape (townscape)/view and maintains landscape quality.

Beneficial – improves landscape (townscape)/view quality and character, fits with the scale, landform and pattern and enables the restoration of valued characteristic features or repairs / removes damage caused by existing land uses.

Impacts are also categorised according to their longevity or timescale:

- Temporary – Lasting for one year or less
- Short Term – Lasting one to seven years
- Medium Term – Lasting seven to fifteen years
- Long Term – Lasting fifteen years to sixty years
- Permanent – Lasting over sixty years

A statement is made as to the appropriateness of the proposed development based on the combined assessment of the predicted landscape and visual impacts.

This methodology, in accordance with the various guidelines for LVIA, results in a conclusion as to the appropriateness of the proposed development based on objective assessment of its likely landscape and visual impacts

12.3 Baseline Description of Existing Conditions

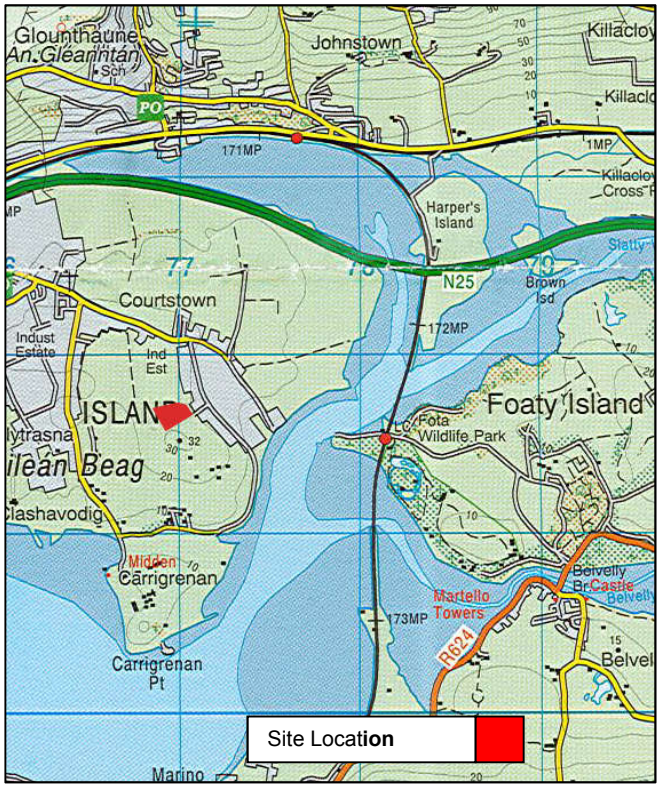
12.3.1 Planning Policy

There are no designations directly affecting the proposed development site. Nonetheless, environmental designations associated with Cork Harbour, including Special Protection Area (SPA), Special Area of Conservation (SAC) and Proposed Natural Heritage Area (pNHA) are noted.

Scenic Route S53, Route between Cobh and Belvelly, could potentially be impacted by the proposed development.

12.3.2 Proposed Development Site Context

Figure 12.1 Site Location Plan



Little Island is a significant industrial / business location with pockets of established housing and some significant green spaces notably Cork Golf Club and the former Harbour Point Golf Club.

The N25 (M3) Cork to Waterford Road runs along the northern extremity of Little Island. The Island otherwise addresses Inner Cork Harbour including Lough Mahon to the south and is prominent in views from shoreline locations to the south, east and west including the amenity walkway at Ringmahon, the R610 Rochestown Road to the south and the R624 to Cobh to the south-east.

Topography across Little Island is generally gently undulating from low points around the extremity of the island to localised elevated ground reaching +O.D.20m just south of Island Cross Roads and a high point of +O.D.32m further east on the former Harbour Point Golf Course. It is proposed that the new warehouse facility will have a maximum height of approximately 12.8 m, a reduction on the 14.5m height of the permitted waste facility on the site proposed through planning application 07/10229.

Photograph 1 View towards site from the R624 Fota to Cobh road.

Photograph 2 Entrance to Harbour Point Business Park

Photograph 3 Approach to existing business premises to the south of the site

Photograph 4 View eastwards towards Fota Island from southern section of the business park access road

Photograph 5 View along main access avenue to business park

12.3.3 Site Environs and Local Area Character

The proposed development site is located immediately to the rear of existing industrial premises situated along the main access road into Harbour Point Business Park. The business park is defined by a gateway and access avenue along which there is a range of large scale industrial warehouse and business premises. Tree and shrub planting along sections of the access avenue have a softening effect on the environment. At the southern end of the access road there are panoramic views across the harbour environment towards Fota Island and Cobh.

The proposed development is located within a green field site, the eastern boundary of which abuts existing business/warehousing premises and contains some vegetation including oak, goat willow, gorse and bramble. The northern boundary is defined by a hawthorn hedge and two ash trees. The western boundary is defined by dense vegetation cover including hawthorn and elder. Dense vegetation on the other side of the western boundary includes poplar, pine, alder and Monterey cypress. The southern boundary of the site is undefined in the field which the site forms part of. The field is currently unmanaged and consists of grass sward which has become heavily infested with weeds.

Photograph 6 View southwards across proposed development site

Photograph 7 View eastwards showing existing adjacent industrial premises and distant high ground

Photograph 8 View north towards Glounthaune from northern site boundary

Photograph 9 View of existing significant screen vegetation along western boundary.

The description of the receiving environment is divided into three main categories of landscape characteristics, namely, physical, cultural and visual/sensory, which in combination generate the landscape character of an area.

12.3.4 Landscape Characteristics and Values

The above descriptions identify an extensive range of characteristics and values of the receiving environment that might be affected by the proposed development. Landscape values can be described as the environmental or cultural benefits, including services and functions that are derived from various landscape attributes. These attributes will, in many instances, be the components and image of the landscape as already established in the assessment of landscape character". (Department of Environment, Heritage and Local Government, Landscape and Landscape Assessment Consultation Draft of Guidelines for Planning Authorities, 2000)

The Guidelines differentiate between enhancement values (values of a socio-economic nature pertaining to development and thus environmental change), and cultural, social or ecological conservation values (concerned with natural landscape integrity and the inclination towards constraint in terms of environmental change).

Enhancement values reflect where policy, inevitable change or degraded features provide the scope to restore, or the opportunity to alter, or create, a new characteristic. The enhancement values reflect change that is already occurring, as well as potential capacity of parts of the receiving environment.

The conservation values indicate those aspects of the receiving environment which are sensitive and could potentially be negatively impacted on by the proposed development. These values form the landscape and visual constraints to the proposed development.

12.3.5 Conservation Values

- Potential loss of greenfield buffer along town edge.
- Potential impact on sensitive receptors such as adjacent residents and visitors to the town.
- Potential impact on mature hedgerows along the perimeter on the site.
- Potential impact on views and vistas.

12.3.6 Enhancement Values

- Opportunity to enhance Little Island's recognised role as a district employment centre.
- Opportunity for innovative and sensitive design to meet the demand for business expansion while avoiding significant adverse landscape and visual impacts.
- Potential to enhance the landscape infrastructure of the site.

12.3.7 Landscape Impact

The landscape sensitivity of the proposed development's receiving environment is classified as Medium: It exhibits positive character in respect of its natural boundary screening to the north and west but is part of an industrial site of mixed character. Designated scenic routes associated with the wider harbour are potentially sensitive to change as are residential areas on high ground to the north in Glounthaune although distance has a significant mitigating effect in these instances.

The scale or magnitude of landscape effects (or the quantity of change) to be imposed on the landscape by the development is classified as Medium. There would be alteration to the existing greenfield site and but the introduction of buildings of the type proposed will not be uncharacteristic in the context of the receiving industrial environment.

On balance, there will be a predicted **Medium and Neutral Significance** of impact on Landscape Character reflecting the capacity of the industrial zone to accommodate development of this nature without incurring significant landscape impacts on the local or wider harbour landscape settings.

12.3.8 Visual Impact

The visual impact of the proposed development has been closely examined and we have seen that;

Of the seven viewpoints assessed it is anticipated that:

1. The short-term impact will be:

- **No change** for two of the viewpoints, **medium neutra**l for four of the viewpoints and **medium neutral** for the remaining one viewpoint.

2. The medium to long term impact will be (i.e. after completion and development of any mitigating landscape treatment that may be required):

- **No change** for two of the viewpoints, **medium neutra**l for four of the viewpoints and **medium neutral** for the remaining one viewpoint.

At the macro (wider) landscape level, views of the proposed development site are long range in which the proposed development appears among existing development of a similar nature and in which distance has a diminishing effect on visual impacts (Views 1, 6 & 7).

At the micro (local) landscape level the proposed development will constitute a significant intervention on the site but visual impacts are mitigated by existing adjacent developments of a similar nature and existing screen vegetation which occurs along the northern and western site boundaries which will be augmented by the provision of additional tree planting, notably to the north and south of the proposed building. (Views 1, 3, 4 & 5)

12.4 Assessment of Impacts

12.4.1 Landscape Impact

The proposed development will transform the green field site to an operational re-cycling facility. The nature of the proposed development will be very much in keeping with existing adjacent developments in the business park in terms of building form and scale. As such, it will not constitute an intrusive element in the local landscape setting. Furthermore, the significant screen vegetation which prevails along the western boundary of the site will mitigate impact on the adjacent golf course site. In wider views from the N25, Glounthaune and the inner harbour shoreline, distance will have a diminishing effect such that landscape character will not be affected from these locations

The sensitivity of the landscape resource is a function of its land use, landscape patterns and scale, visual enclosure and distribution of visual receptors and the value placed on the landscape. The landscape sensitivity of the proposed development's receiving environment is classified as Medium: While the site and is zoned for industrial development in an established industrial business park location, areas associated with the Inner Harbour are potentially sensitive to change.

The wider harbour to the east of the site is potentially sensitive to change on the site as is the former golf course site to the west but the site can accommodate alteration given the significant screen vegetation along the western boundary of the site and the nature of existing industrial development in the vicinity of the site which will tend to absorb impacts associated with the proposed development.

The scale or magnitude of landscape effects (or the quantity of change) to be imposed on the landscape by the development is classified as Medium. There would be alteration to one or more key elements or features of the area, and the introduction of elements that would be prominent, but not substantially uncharacteristic in the context of the receiving environment, particularly the established function of Little Island as an industrial/commercial centre.

However, on balance, this is well considered change in the context of existing adjacent development. This results in an overall **Medium and Neutral Significance** of impact on Landscape

Character reflecting fulfilment of the business potential of the site in this industrial area. This impact would be evident once the development was fully completed and in operational phase and would be **Permanent**.

Construction Phase
The landscape impact in the construction phase would be – **Medium and Neutral.** This would be **Temporary.**

12.4.2 Visual Impact

Based on the assessment of the landscape characteristics, values and sensitivities, 7 viewpoints were selected for assessment of visual amenity impact. These are divided into two categories, namely *Immediate Views (Micro Landscape)* and *More Distant Views (Macro Landscape).*

Table 12.2 - Viewpoints for Visual Impact Assessment

No	Location	Direction Of View	Viewpoint Type	Distance to site
1	Ballynaroon, Glounthaune	SouthEast	Residential	2.0km
2	Clash Road, Little Island	East	Residential	0.5km
3	Castlelake	North	Residential	0.5km
4	Business Park Road, East of Site	West	Business Park Access Road	0.25km
5	Ballytrasna Park	South	Residential	0.35km
6	N25 North East of Site	SouthWest	Arterial Route	2.0km
7	R624 Cobh Road	NorthWest	Shoreline	2.0km

Distances from the site are from the viewpoint to the nearest boundary of the proposed development site. Figure 12.1 below illustrates the locations of the above viewpoints.

For each viewpoint that would be affected by the proposed development, the field of view towards the application site is briefly described, and illustrated with a wide-angle photograph.

The potential visual impact on each viewpoint is assessed below, based on the degree / quantity of change to the field of view (towards the site) which would result from the proposed development and the sensitivity of the visual receptors at that location. The significance of the visual impact is scored and the quality of that impact.

Finally, a conclusion is made as to the predicted visual amenity impact in the operational phase and timescale. The Construction stage is also commented on.

Figure 12.2- Visual Envelope and Viewpoints – Landscape

Viewpoint 1 - Ballynaroon, Glounthaune

Site as currently exists

Photomontage view of proposed development

Description of View

The selected viewpoint is located approximately 2.0km to the north of the proposed development site on an access road to a number of residential dwelling units.

Existing View

The view towards the proposed development site from this location reveals the elevated nature of the ridge at Glounthaune and the panoramic views which are facilitated from some locations. The character of the harbour landscape is defined by a combination of water and undulating landform. Harbour Point Business Park is visible in the view.

Proposed View and Mitigation

The photomontage view provides an outline of the proposed development. It shows that there will be no visual impacts experienced from this location given the relative position of the development among existing developments and the diminishing effect of distance from this location.

VIA Result

- The viewpoint sensitivity is considered high given the residential nature of the location.
- The degree of change from this viewpoint would be low in the short to medium term and low in the long term given the manner in which the proposed development integrates among existing development and the diminishing effect of distance from this location.
- The significance of the visual impact will be medium neutral in the short to medium term and medium neutral in the long term given the manner in which the proposed development will be integrated among existing development

During the construction phase the degree of change would be low and the significance of this would be low neutral.

Viewpoint 2 - Clash Road, Little Island

View towards proposed development site

Description of View

The selected viewpoint is located approximately 0.5km to the west of the site on Clash Road along which there is a significant number of residential properties.

Existing View

This view typifies the relationship between the detached residential properties and the adjacent golf course site across which there is significant vegetation cover. The vegetation provides a visual screen which blocks views eastwards and provides a pleasant backdrop to the residential area.

Proposed View and Mitigation

There will be no visual impacts experienced along Clash Road given the screening effect of vegetation to the rear of the properties which means that the proposed development site will not be visible from this location. It is, therefore, not deemed necessary to provide a photomontage image under these circumstances.

VIA Result

- The viewpoint sensitivity is considered high, given the residential nature of the location.
- The degree of change from this viewpoint would be no change in the short to medium term and no change in the long term given the manner in which the proposed development will be screened from view from this location.
- The significance of the visual impact will be no change in the short to medium term and no change in the long term given the manner in which the development will be screened from view from this location.

During the construction phase the degree of change would see no impacts experienced.

Viewpoint 3 - Castlelake

View towards proposed development site

Description of View
The selected viewpoint is located approximately 0.5km to the south of the site on Clash Road adjacent to a number of residential properties

Existing View
This view shows the relationship between the detached residential properties at the cul-de-sac end of Clash Road and the golf course to the rear of the properties. The vegetation along with variations in the local topography provide a visual screen which blocks views northwards towards the proposed development site. The setting has a rural character with significant tree cover.

Proposed View and Mitigation
There will be no visual impacts experienced from this location on Clash Road given the screening effect of vegetation to the rear of the properties and variations in topography which means that the proposed development site will not be visible from this location. It is, therefore, not deemed necessary to provide a photomontage image under these circumstances.

VIA Result

- The viewpoint sensitivity is considered high, given the residential nature of the location.
- The degree of change from this viewpoint would be no change in the short to medium term and no change in the long term given the manner in which the proposed development will be screened from view from this location.
- The significance of the visual impact will be no change in the short to medium term and no change in the long term given the manner in which the development will be screened from view from this location.

During the construction phase the degree of change would see no impacts experienced.

Viewpoint 4 - Business Park Road, East of Site

Site as currently exists

Description of View
The selected viewpoint is located approximately 0.25km to the south east of the proposed development site on the main access road into the business park.

Existing View
This view shows the main access road into the site and the alignment of the businesses along it. The business park environment is defined by typically large scale development. The undeveloped plot in the foreground reflects the phased nature of development associated with the park.

Proposed View and Mitigation
While a small section of the upper part of the proposed development building may be visible in the distance above the existing building line, it is anticipated that it will not constitute significant visual impact from this location. The proposed development will be integrated among developments of a similar nature and will thus not appear as an intrusive element in the business park setting. It is, therefore, not deemed necessary to provide a photomontage image under these circumstances.

VIA Result

- The viewpoint sensitivity is considered medium given the business park nature of the location where the emphasis is on movement to and from business premises.
- The degree of change from this viewpoint would be low in the short term and low in the medium to long term as while part of the proposed development may be visible from this location it will not be dominant or intrusive relative to its surroundings.
- The significance of the visual impact will be medium neutral in the short term and medium neutral in the medium to long term as the proposed development will not be intrusive in this view.

During the construction phase the degree of change would be low and the significance of this would be low neutral.

Viewpoint 5 - Ballytrasna Park

Site as currently exists

Photomontage view of proposed development

Description of View

The selected viewpoint is located on the approach road to the business park near the main entrance adjacent to a residential property, approximately 0.35km from the proposed development site.

Existing View
This view shows the northern boundary of the proposed development site which is defined by the hedgerow at the far end of the field. The hedgerow screens views directly on to the site while the large building located to the south of the site is visible on the skyline. The view is, thus, semi-rural in character with the presence of the business park revealed by the building profile in the distance.

Proposed View and Mitigation
The proposed development will be visible from this location but will not constitute a significantly intrusive intervention given the presence of the existing building elevation in the view and the nature of the screening provided by the hedgerow along the northern boundary of the site.

VIA Result

- The viewpoint sensitivity is considered high, given the location of a residential property on the approach road to the business park.
- The degree of change from this viewpoint would be medium in the short term and medium in the medium to long term given the manner in which the development will be evident from this location but not particularly intrusive in the context of the existing view.
- The significance of the visual impact will be high and neutral in the short to medium term and high and neutral in the long term as while the development will be visible from this location visual impact will be mitigated by a combination of distance, existing boundary vegetation and proposed screen planting which will augment the existing hedgerow trees.

During the construction phase the degree of change would be low and the significance of this would be low adverse.

Viewpoint 6 - N25 North East of Site

Site as currently exists

Description of View
The selected viewpoint is located on the N25 main Cork to Midleton road, approximately 2.0km from the proposed development site.

Existing View
The view towards the proposed development site from this location reveals the overall character of the harbour defined by the expanse of water, landform vegetation and built elements including Harbour Point Business Park and the folly on the promontory at Fota Island.

Proposed View and Mitigation
The upper portion of the proposed development will appear in the view among existing business park buildings. In this respect it will not constitute a significant intervention in the view given the manner in which it will be integrated among existing buildings with a similar profile and colour. It is, therefore, not deemed necessary to provide a photomontage image under these circumstances.

VIA Result

- The viewpoint sensitivity is considered high given the nature of the location as a primary approach route to Cork City.
- The degree of change from this viewpoint would be low in the short to medium term and low in the long term given the manner in which the proposed development integrates among existing development and the diminishing effect of distance from this location.
- The significance of the visual impact will be medium neutral in the short to medium term and medium neutral in the long term as there will be no significant visual impacts experienced.

During the construction phase the degree of change would be low and the significance of this would be low neutral.

Viewpoint 7 - R624 Cobh Road

Site as currently exists

Photomontage view of proposed development

Description of View

The selected viewpoint is located on the R624 Carrigtohill to Cobh road, approximately 2.0km from the proposed development site.

Existing View

The view towards the proposed development site from this location shows the broad expanse of water associated with the Inner Harbour, Fota Island to the right and Little island in the distance set against the backdrop of the distant high ground at Glounthaune. Existing development at Harbour Point Business Park is visible on the shoreline.

Proposed View and Mitigation

The photomontage view shows that while the proposed development will be visible from this location, visual impact will be mitigated by the relative position of it among existing developments of a similar scale and finish in elevations and the diminishing effect of distance from this location. Remedial mitigations measures comprise tree planting along the southern boundary of the site which will reduce the scale of the southern elevation and provide a sense of separation between buildings.

VIA Result

- The viewpoint sensitivity is considered high given the shoreline nature of the location relative to the Inner Harbour environment and the route to Cobh as a visitor destination.
- The degree of change from this viewpoint would be medium in the short to medium term given the profile of the proposed development in the view and low in the long term as tree screen planting along the southern boundary matures and screens the southern elevation.
- The significance of the visual impact will be medium neutral in the short to medium term given the manner in which the proposed development is positioned among existing buildings of similar form, scale and colour and low neutral in the long term as screen planting along the southern boundary of the site matures.

During the construction phase the degree of change would be low and the significance of this would be low neutral.

Table 12.6.1 - Results of Visual Impact Assessment

No		Location / Description	Viewpoint Sensitivity	Degree of Change	Predicted Impact				
					Temporary (construction)	Short Term	Medium Term	Long Term	Permanent
		Macro (Wider) Landscape Viewpoints							
1		Ballynaroon, Glounthaune	High	Low	Low Neutral	Medium & Neutral			
2		Clash Road, Little Island	High	No Change	No Change	No Change			
3		Castlelake	High	No Change	No Change	No Change			
4		Business Park Road, East of Site	Medium	Low	Low Neutral	Medium & Neutral			
5		Ballytrasna Park	High	Medium	Low Adverse	High & Neutral			
6		N25 North East of Site	High	Low	Low Neutral	Medium & Neutral			
7		R624 Carrigtohill to Cobh Road	High	Low	Low Neutral	Medium & Neutral	Low Neutral	Low Neutral	Low Neutral

Beneficial			Neutral	Adverse		
High	Medium	Low	L, M, H	Low	Medium	High

12.5 Proposed Mitigation and Enhancement Measures

Landscape mitigation measures will consist of a 20m planting buffer on the western boundary of the site with native tree and hedgerow species to augment existing retained boundary vegetation. This planting will further integrate the development in the setting as it matures.

12.6 Residual Impacts

Residual impacts associated with the proposed development relate to building elevations, the upper sections of which may remain visible above the proposed boundary screen planting. (Ref. Views 5 & 7). However, in the context of the existing industrial / business park environment and the distance associated with View 7, such impacts will not be significant.

12.7 Cumulative Impacts

Cumulative visual impacts associated with the proposed development relate to the increase in the scale and massing of the built environment on the business park as new development occurs in line with zoning objectives for the area. This impact will be mitigated by proposed site boundary planting which will contrast with the building elevations, thus, mitigating the perception of their scale while also providing a sense of separation between them.

12.8 Summary and Conclusions

This assessment finds that the proposed development of a waste recycling and transfer facility will not incur significant impacts in respect of local landscape character or sensitive visual receptors in the environs of the site, i.e. local or distant residents or users of the surrounding road network infrastructure.

While the proposed development represents a significant intervention in the business park environment by virtue of its scale and form, landscape and visual impacts are mitigated by a combination of existing screen vegetation to the west and north of the site, the location of the proposed development among existing developments of a similar typology and the diminishing effect of distance in views from the southern shoreline of the Inner harbour.

Remedial mitigation measures include tree planting along the northern boundary of the site to augment the existing hedge-line and tree planting along the southern boundary to assist mitigate impacts in distant views from the south.

It is noted that the recent planning application in respect of the LI-X-02 lands to the north- west of the site (Planning Ref. 186021) includes proposals for a significant planted buffer zone along the south eastern boundary of the site which would provide a significant visual screen as it matures.

The absence of adverse impacts generally reflects the manner in which the proposed development will be integrated in the business park environment and the appropriateness of the development as a response to development plan objectives and zoning for the site.

13 Chapter Thirteen – Material Assets and Climate

13.1 Introduction

The Draft Advice Notes for Preparing Environmental Impact Statements produced by the EPA in September 2015 state that "*Resources that are valued and that are intrinsic to specific places are called 'material assets'. They may be of either human or natural origin*".

Page 32 of the draft EPA Guidelines on the 'Information to be Contained in Environmental Impact Assessment Reports' published in August 2017 determines Material Assets as follows:

"Material assets can now be taken to mean built services and infrastructure. Traffic is included because in effect traffic consumes roads infrastructure".

The objective of this assessment is to ensure that local and regional assets are used in a sustainable manner and to ensure their continued availability for future generations following the development of the project.

13.1.1 Competent Expertise

The assessment of human health was completed by David Heelan of OES Consulting. David possesses a BA (hons) form University College Dublin specialising in History and Archaeology and also an MSc. in Regional and Urban Planning from Heriot Watt University, Edinburgh and is a chartered town planner with the Royal Town Planning Institute (RTPI). David has worked as an environmental consultant and town planner since 2008 and has produced material assets and climate assessments for a diverse range of developments such as wind farms, roads, bridges, creameries, schools and hydroelectric power plants throughout Ireland, and the United Kingdom

13.2 Proposed Development – Nature, Use and Significance

13.2.1 Nature & Use

The proposed waste transfer facility is essentially a new warehouse functioning as a waste processing plant. It will include the acceptance of source separation waste (e.g. brown bin waste, glass packaging, cardboard and co-mingled packaging waste) along with residual municipal waste and skip waste from household and commercial sources. The facility will allow for the diversion of different waste types to non-disposal waste management routes, by means of manual sorting and mechanical treatment (crushing, grading, magnetic separation, ballistic separation, sorting, baling, etc).

The facility will be operated under a waste licence to accept non-hazardous wastes (primarily household, construction and demolition and commercial waste) only at this facility.

13.2.2 Significance

The proposed development seeks to address the current lack of material waste recovery facilities in County Cork and intends to meet the aims of the Regional Planning guidelines in relation to the development of Materials Recovery Facilities of which a need has been highlighted and discussed above in Chapter 3.

The following sections address the relevant material assets applicable to the proposed development to ensure these resources are used in an equitable and sustainable manner.

The objective of the assessment of such assets is to ensure that they are used in a sustainable manner, to ensure continued availability for future generations after the development of the project.

13.3 Assessment

Examples of material assets relevant to the proposed development include:

- Assimilative capacity of air and water and sterilisation of resource;
- Minerals, soils, oil, gas;
- Transportation infrastructure (roads, railways, canals, airports etc), and
- Major utilities (water supplies, sewage, power systems, telecommunication systems).

13.3.1 Assimilative Capacity of Air and Water and Sterilisation of Resource

Air

As discussed in Chapter 9, A detailed air quality assessment has been undertaken to determine the impact on local air quality resulting from the operation of the proposed Little Island waste facility site in terms of emissions to air.

The facility and operational processes have been designed to prevent air quality and odour impacts and emissions occurring at the site. All waste processing, sorting and baling will be undertaken within the facility building itself, with a negative air pressure and odour extraction and treatment unit operating within the building. Storage of waste materials outside of the building will not occur, further reducing the potential for odour emissions from waste on site.

It is not envisaged that the proposed facility will impact on local air quality or generate adverse odours.

Water

As discussed in Chapter 7 above, there are no rivers or streams within or in the immediate vicinity of the development site. The northern boundary of the proposed site contains a drainage ditch which is associated with improvements for agricultural purposes. The ditch is generally in a somewhat degraded condition and inundated with vegetation but appears effective in draining surface water towards the existing industrial properties to the east, discharging to the adjacent storm water network in the industrial estate. There are no other surface water features on the site.

Due to the absence of river and streams within the development site and the proposed implementation of the best practice mitigation measures to protect ground water and field drains from contamination during both the construction and operational stages discussed above in **Chapters 6 and 7**, the proposed development will not impact on the integrity or quality of local river bodies or streams within Little Island or on the quality of water flowing into the catchment of the River Lee, the Cork Harbour Special Protection Area (SPA) and the Great Island Channel Special Area of Conservation (SAC) and proposed Natural Heritage Area (pNHA). Local and regional natural water resources will not be impacted by the proposed development.

All process wastewater from the site will be directed off-site to connect with the existing Little Island municipal foul drainage network. Foul drainage at the site will connect into the existing foul drainage network located at the entrance of the development as shown on **Drawing 1007**. A connection to the municipal sewer network will be established for the sanitary waste waters associated with the office

block. Emissions to sewer are solely associated with the sanitary requirements of the office buildings on site, and do not include process water emissions.

The drainage for the external hard standing areas will pass through an interceptor (full retention) prior to discharge to the storm sewer connection shown on **Drawing 1006**. Foul water will be cleaned of petrochemical contamination by passing through a 4000 litre full retention separator. Surface water from the roof will pass through a class two interceptor before discharging to the storm sewer. Runoff from the internal floor area will drain via a full interceptor to the foul sewer as shown on **Drawing 1008**.

The proposed development will not abstract groundwater from onsite wells or boreholes for usage on site. The facility proposes to connect with the existing Cork Metropolitan municipal water supply via the connection point shown on **Drawing 1003**. The proposed facility will utilise approximately 10m^3 per day which will not place undue pressure on local water supply infrastructure of flows servicing Little Island.

Overall the proposed development will not impact on the existing natural and supplied water sources within and surrounding Little Island.

Sterilisation of Resource

The proposed development site is zoned within the county and local municipal district plans industrial/business zoned purposes and is located within an existing built up industrial part of Cork City. The site is not used for prime agricultural purposes and as discussed above has already been subject to a successful planning application for the development of waste transfer and recycling facility by Cork County Council in 2008. The proposed development complies with the development aspirations that Cork County Council have listed for the site and its development will not reduce prime agricultural lands within the county of Cork.

13.3.2 Minerals, Agricultural Lands and Soils

The proposed development will have no impact on local mineral resources.

13.3.3 Transportation Infrastructure (roads, railways, canals, airports)

Bridges

The proposed development will result in no impacts on pedestrian or road bridges.

Roads

The traffic and transport assessment completed below in Chapter 14 below determined that the proposed development will have an unnoticeable impact upon the established local traffic conditions and can easily be accommodated on the local and regional road network, conscious of the established busy conditions within Little Island generally. The addition of a total of worst case 44 Car Equivalent movements during the peak hour is considered to have a negligible effect. The capacity of the key junctions to be utilised by site traffic has been assessed using proprietary modelling tools and this confirmed that adequate capacity exists. A review of the Road Safety Authority database records indicates that there is no history of any reported accidents whatsoever in the area of the proposed development. In this regard, given the very low additional traffic volumes, it was concluded that the development will not have any adverse impact upon traffic safety. It is considered that the proposed

development will result in no significant operational traffic safety or road capacity issues affecting the established vehicular access or the established road network.

Canals and Airports

The proposed development will result in no impacts on canals and airports.

13.3.4 Major utilities (water supplies, sewage, power systems, telecommunication systems etc)

The proposed developments will not be constructed within proximity to major utility supply infrastructure and will result in no impacts on existing under or above ground services.

As discussed above, the proposed facility will utilise approximately 10m^3 per day which will not place undue pressure on local water supply infrastructure of flows servicing Little Island. All process wastewater from the site will be directed off-site to connect with the existing Little Island municipal foul drainage network. Foul drainage at the site will connect into the existing foul drainage network located at the entrance of the development as shown on **Drawing 1007**. A connection to the municipal sewer network will be established for the sanitary waste waters associated with the office block. Emissions to sewer are solely associated with the sanitary requirements of the office buildings on site, and do not include process water emissions.

The proposed facility will utilise approximately 8,500 KWh/Week of electricity. Other power sources such as gas will not be used on site. This level of utility usage will not place additional pressure on the electricity supply infrastructure within Little Island.

13.4 Climate

13.4.1 Climate in the Existing Environment

The EPA have outlined the criteria which require assessment in EIARs in relation to climate issues. Section 4.10 of the draft 2015 Advice [4]Notes states that:

"Climate may refer to local climatological conditions (long-term weather patterns such as local wind flow, temperature, rainfall or solar radiation patterns) and particular "microclimate" effects of the project location due to, for example, localised heat island effects, the effects of buildings / shade or coastal effects. Alternatively, climate may refer to the impact of the project in the context of greenhouse gas (GHG) emissions and potential effects associated with climate change. Determining whether a project will have a significant impact on current and future climate requires an understanding of the vulnerability of the project to climate change, the likely magnitude of GHG emissions associated with the activity as well as an understanding of the likely local impacts of climate change throughout the timescale of the project.

Page 32 of the draft "*Guidelines on the information to be contained in Environmental Impact Assessment Reports*" produced in August 2017 states the following:

"The list of environmental factors which needed to be addressed under Directive 2011/92/EU included climate. The amended Directive also requires the vulnerability of a project to climate change to be

[4] *Advice Notes For preparing Environmental impact statements Draft, EPA, September 2015*

addressed, particularly 'the risk of major accidents and/or disasters which are relevant to the project concerned, including those caused by climate change, in accordance with scientific knowledge'

This section of the EIAR will focus on assessment on the potential impacts of the proposed development on climate change parameters such as greenhouse gases and will also discuss the vulnerability of the proposed waste transfer and recycling facility to the consequences of climate change and major accidents/disasters.

13.4.2 Climate Background

Meteorological Data

The nearest climatological and synoptic meteorological stations to the proposed development site are located at Cloyne, Cork (15km east), Dungarvan (80 Km to the north-east) and Glengarriff, Kerry (120km to the West). These stations provide a good approximation of the conditions that prevail in the area. Although Glengarriff is further away from Little Island than Dungarvan, it is considered that the wind speeds and directions would be similar to the Cloyne station given Little Island's close proximity to the coast. The incidence of low wind conditions indicates that about 25% of hourly observations are likely to be less than 3.1m/s with calm conditions occurring about 0.5% of the year. Based on wind speed and direction information from the Cloyne climatalogical station, the dominant wind direction in the Cork region is South Westerly.

Precipitation

Annual rates of precipitation in the area have an average of approximately 1,228mm with the months of October to January receiving the greatest monthly rates. The nearest climatological station with long-term daily rainfall rates is at Cork Airport covering the period 1981 - 2010 (Met Eireann). The results indicate long term monthly mean precipitation rates ranging from 80.9 – 138.2 mm, as can be seen in **Table 13.1** below. During the winter rainfall would be commonly associated with Atlantic frontal depressions whereas during the summer months high rainfall amounts tend to be associated with intense thunder showers which may be localised in rainfall intensity.

Table 13.1 - Monthly Precipitation Rates at Cork Airport (mm)

Table 13.1 - Monthly Precipitation Rates at Cork Airport (mm)													
Period	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**Annual**
1981 - 2010	131.4	97.8	97.6	76.5	82.3	80.9	78.8	96.8	94.6	138.2	120.0	133.1	1227.8

Air Temperature

The pattern of long term mean daily temperatures at Cork Airport meteorological station is shown in Table 13.2. Given the location of the station to Little Island similar conditions would be experienced at the facility.

Table 13.2 - Monthly Mean Temperatures at Cork Airport (°C)

Table 13.2 - Monthly Mean Temperatures at Cork Airport (°C)													
Period	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**	**Annual**
1981 - 2010	5.6	5.7	6.9	8.4	10.9	13.5	15.3	15.2	13.3	10.5	7.8	6.1	9.9

13.4.3 Potential Impact of the Proposed Development on Climate Change

All waste will be sorted and stored within the Waste Transfer and Recycling building with a very short turnaround time. This, coupled with the nature of the waste ensures there is no potential for the waste to generate any gaseous emissions on-site. In addition, leachate will not be generated on-site due to the enclosure of the waste transfer operation. Due to the relatively low wind speeds and the nature of the operations on-site the possibility of wind-blown dust being carried long distances or in elevated concentrations is minimised.

The proposed development will not result in significant impacts on local air quality or produce vast amounts of emissions that would have the potential to impact on the local climate. Operations at the site are limited to manual and mechanical sorting and separation, baling and other sorting related activities. No combustion, gasification or pyrolysis processes will occur onsite and emissions form such activities will not be present onsite.

Emissions from the proposed internal area will be via the air treatment unit, ensuring no malodours or dust are emitted from the processing building. No combustion exhausts are proposed at the site.

As the proposed development will not emit significant air emission during operation and emissions of carbon from the vehicles servicing the site will be small, the contribution made to the Greenhouse Effect as a result of operations at the proposed facility is negligible.

13.4.4 Vulnerability of the Proposed Development to Climate Change and the Risk of Major Accidents

The proposed development is not vulnerable to the potential impacts on a coastal site such as flooding. As concluded in Section 7.5 above, the proposed development site is not at risk of fluvial, coastal or pluvial flooding and is not located within Flood Zone A or B.

The proposed development will utilise electricity as its primary power source. Natural gas will not be utilised onsite which will reduce the potential for major accidents onsite. Hazardous and contaminated waste will not be accepted at the proposed facility, reducing the potential for flammable and incendiary materials to be processed within the site boundary. Non hazardous waste will be processed within the facility and will be moved off site as efficiently as possible to prevent the build up of a sufficient fuel source should a fire break out. CCR will apply for a waste licence from the EPA under which to operate the site which will include strict monitoring, safety and management requirements which will be implemented onsite to ensure the safe operation of the facility.

13.5 Residual Impacts / Conclusion

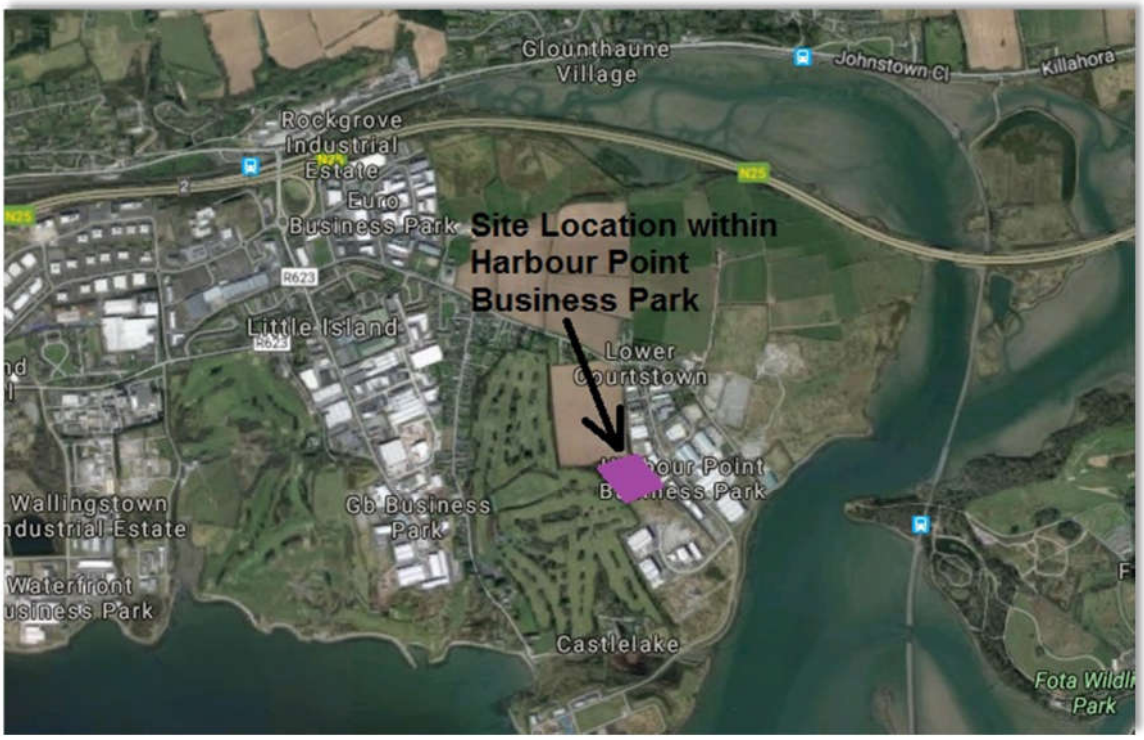
The proposed development will not adversely impact on local and material assets within and surrounding Little Island. Local air quality and water resources in the form of rivers, streams and lakes will not be adversely impacted by the proposed waste transfer and recycling facility. The development will not reduce agricultural land, minerals or soils resources within County Cork and will not place undue pressure on the provision of local utilities such as electricity, water and sewage. The proposed development is not at risk of flooding, will not increase flood risk elsewhere and will not result in a significant impact on greenhouse gas production or local air quality within Little Island.

14 Chapter 14 Traffic and Transport

14.1 Introduction

This Traffic & Transportation Assessment (TTA) has been prepared by NRB Consulting Engineers Ltd and addresses the traffic capacity considerations relating to the proposal to construct a recycling facility within an established industrial and business park, in Little Island in Cork. The assessment addresses the impact of the proposed development on the adjacent road network for both the critical weekday AM and weekday PM Peak hours. A site location plan for the development is included below as Figure 14.1 below.

Figure 14.1: Site Location Plan in Context of Little Island



14.2 Competent Expertise

This traffic and transport assessment has been completed by Eoin Reynolds of NRB Consulting Engineers. Eoin is a Chartered Engineer with over 27 years experience in a wide range of civil engineering projects. Eoin specialises in the field of Traffic & Transportation and Roads Design - assessing the infrastructure needs of development.

Eoin provides advice to both private sector and public sector clients on all aspects of roads, traffic and transportation, and mobility management. Eoin is expert in the use of Traffic Engineering Modelling Software (TRICS, ARCADY, PICADY, LINSIG, TRANSYT and Micro-Simulation Techniques), and has given expert evidence at planning appeals, oral hearings and public enquiries. Eoin is a noted Professional/Expert Witness in the field of Traffic/Roads & Road Safety.

14.3 Assessment Structure

In describing the Receiving Environment and the Proposed Future Environment, this report addresses the following aspects of the proposed development:

- Very Small Scale of Development Proposals (conscious that the development constitutes a licensed recycling facility), with access via an established road network,
- Traffic & Transportation impact,
- Capacity of the proposed access to accommodate the worst-case development traffic flows,
- Capacity assessment of the affected junctions using industry standard software,
- Impact of the development on the free flow and capacity of the adjacent Local Roads conscious that there may be extraneous traffic control issues associated with the road network in the area.

Recommendations contained within this assessment are based on the following sources of information and industry-standard practices:

- Transport Infrastructure Ireland (TII) Traffic & Transport Assessment Guidelines,
- TII Project Appraisal Guidelines 'Link-Based Traffic Growth Forecasting' (January 2011),
- Comprehensive new interval Classified Traffic Surveys undertaken in January 2017,
- Our experience in assessing the impact of Developments of this Nature.

The assessment has been prepared in accordance with the requirements of TII's Traffic & Transport Assessment Guidelines. These are the professional Guidelines used to assess the impact of developments on public roads.

14.4 Receiving Environment & Development Proposals

The proposed development site is located on industrial use lands that are surrounded by similar scale and type developments located within the confines of Harbour Point and Courtstown Business Parks. The site is served by the main access road to Harbour Point and Courtstown Business Parks. The main business park access road leads to Ballytrasna Park to the north, and meets this road in the form of a simple priority junction. Observations indicated that the existing junction operates without any significant capacity or queuing issues occurring and this is confirmed through the detailed assessment and simulation analysis contained within this report.

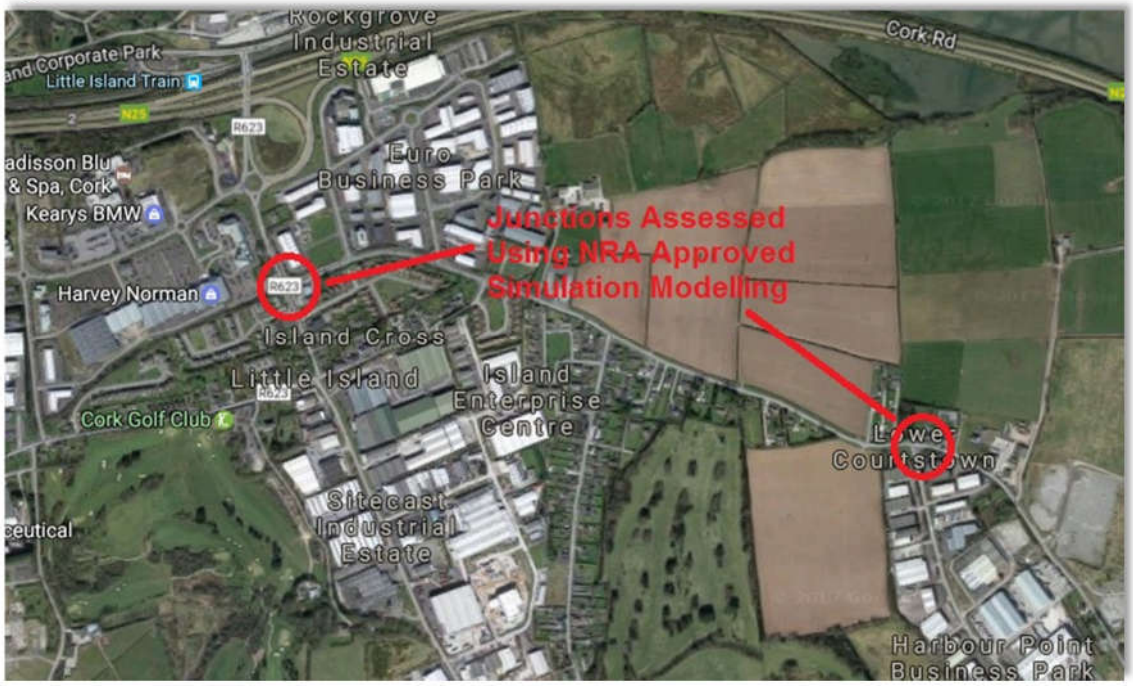
Ballytrasna Park consists of a moderately trafficked single carriageway road. The traffic survey undertaken in January 2017 indicates that the road carries an Annual Average Daily Traffic (AADT) of approximately 3,500 PCUs at the entrance to the Business Parks, and this confirms that it is moderately trafficked in terms of its carrying capacity. The road is subject to a 50kph urban speed limit past the site.

Ballytrasna Park runs generally in an E-W direction and meets the R623 Regional Road in Little Island by way of a 3-Arm junction controlled by traffic signals. Based on the recent traffic survey, the Regional Road R623 is moderately-highly trafficked, with an annual average daily traffic (AADT) flow of approximately 17,500 passenger car units (PCUs) based on the recent traffic survey. In this regard, the road is considered moderately-heavily trafficked. It is recognised that the capacity of roads of this nature are ordinarily determined by the capacity of terminal junctions, however in terms of link capacity the road is moderately trafficked.

Observation indicated that the signal controlled junction operates within acceptable capacity limits, with some short duration queues occurring particularly during the PM Peak Commuter hour. A review of the Road Safety Authority (RSA) online collision database indicates that there is no record of collisions proximate to the site, between 2005-2013 inclusive, from the Business Park Entrance to the Regional Road R623 junction inclusive. Detailed modelling and analysis of the junctions as per Figure

14.2 below was undertaken. Modelling was undertaken for a year of opening 2019 and design year 2034 in accordance with industry Guidelines.

Figure 14.2 - Junctions Assessed



A detailed classified traffic survey was undertaken of the key junctions in proximity to the site during January 2017. This included a comprehensive classified interval survey of each of the affected junctions. This data was used in order to establish current peak commuter hour traffic conditions and to establish the current usage of the roadways. Details of the surveys undertaken are included as **Appendix 14.1, EIAR Volume II**, with the Peak Hour Network flows (expressed as PCUs) identified. This traffic survey has been used as the basis for the study.

14.5 Development Proposals

The Proposed Development results in traffic movements associated with the following activities:

- Baled municipal waste removed to port,
- Food waste removed for further processing,
- Recovered stone from construction and demolition waste,
- Recovered timber from construction and demolition waste,
- Bulky goods removed from the site,
- Refuse trucks transporting incoming domestic waste,
- Builders Skips,
- Staff and service deliveries.

The small relative scale of the entire facility is confirmed through the robust assessment of actual allowed Traffic Generated.

A detailed assessment of impact upon the N25 and the operation of the proposed improved Junction # 2 has been incorporated within the TTA. Cork County Council's proposed Local Junction improvements in the area are now at Tender Stage, and are therefore considered fully committed. The

publicly available downloaded drawings of the CCC proposed improved junctions are included in the detailed report appended to this EIAR **(Appendix 14.1, EIAR Volume II)**.

14.6 Trip Generation, Assignment and Distribution

The Trip Rate Information Computer System (TRICS) database is ordinarily used to ascertain vehicular trip generation associated with the use of any particular site. This generally represents industry standard practice for transportation assessments in Ireland. However, in the particular case of recycling facilities of this nature a detailed activity breakdown based on the proposed licensed uses has been utilised, and this is considered more accurate and appropriate for use in this case.

Appendix 14.1 provides a detailed analysis and assessment of the traffic generated. A summary of the calculations based on the expected uses is included below as **Table 14.1**

Table 14.1: Summary of Anticipated Vehicular Arrivals per Peak Hour (PCUs)

Operation/Traffic Generation Description Provided	*No.*	*Frequency*	*Worst Case Avg No/Hr*	*Equiv PCUs*
Baled Municipal Waste by Artic	120	Every 2 weeks in 48hour period	2.5	8
Recycling Removed by Artic	5	Trucks per wk	1	3
Food waste removed by Artic	3	Trucks per wk	0	0
Recovered Stone Removed by Rigid	5	Trucks per wk	1	2
Recovered Glass Removed by Rigid	2	Trucks per wk	0	0
Bulky Goods Removed by Artic	2	Trucks per wk	1	3
Domestic Waste Trucks	20	Trucks per day	2.5	5
Skip Lorries	30	Trucks per day	3.75	8
Staff and visitors	21	Number per day	21	11
Consumable Deliveries	1	LGVs per day	0	0
Total 2-way in the peak hour (applied for worst-case assessment)			***33 Vehs***	***46 PCU's***
			Total	***44***

The above assessment is based on actual maximum demand at the facility based on proposed licensed usage. It should be noted that we have assigned the above traffic to the local network for peak hours as a robust assessment, which is required under the guidance. However, the reality is that the traffic generated by the facility during the weekday AM and weekday PM Peak hours is expected to be considerably less than outlined.

Notwithstanding, in light of observation of existing capacity conditions, and the existing significantly trafficked roads, the use of higher trip rates, if required, would not have any significant effect on the conclusions of the study. This is particularly the case here given the clear modelled reserve capacity that exists in each junction, which is demonstrated below.

A Traffic Survey was completed of the existing road and affected junctions in order to establish background traffic conditions. Details of the surveys are also included here as **Appendix 14.1, EIAR Volume II**.

All vehicles are expressed in terms of "Passenger Car Units" (PCUs), sometimes referred to as "Car Equivalents". This is the methodology that has been employed here, with specific industry standard conversion factors to convert HGVs, Skip Lorries, Cars/Trailers and Bin Lorries to PCUs. The conversion factors used are in accordance with industry-standard recommendations. The traffic to the road network has been assigned based on the reasonable and industry standard assumption that the trip patterns will mirror the existing established weekday AM and PM peak hour traffic count data in terms of traffic turning proportions and distribution at junctions and in particular here, they reflect the observed patterns during the commuter peak hours on the local roads.

The TII Guidance recommends that traffic assessment provide a robust and onerous assessment of the likely impact of the proposed development in order to provide reassurance that the road infrastructure is adequate to accommodate a facility. The development traffic has therefore been assigned to the local roads based on the onerous assumption that all of the traffic is new traffic. The resulting traffic flow diagrams for the subject site are included as **Appendix 14.1**.

A year of opening of 2021 was selected for the purposes of this assessment, however it should be noted that minor changes of 2-3 years in the selected or actual year of opening will have no impact whatsoever on the conclusions of the study. An assessment of the Design Year 2036 was also undertaken, 15 years following opening.

Traffic growth factors for future year assessments were calculated from data obtained in the TII Project Appraisal Guidelines Unit 5.5, which provides the recommended method of predicting future year traffic growth on Roads. Calculations are included in Table 14.2 below (based on tabulated 'medium growth' in the Cork Area).

Table 14.2 - Traffic Growth Rates, TII Project Appraisal Guidelines

Year	to Year	Table 5.5.1:
2018	2021	1.026
2021	2036	1.21

14.7 Traffic Impact - Access Junction Capacity

The methodology of this assessment has followed TII's Traffic and Transportation Assessment Guidelines, in the assessment of the traffic impact resulting from the proposed development.

A detailed assessment has been completed of the critical junctions that are considered likely to be affected by the low volumes of traffic generated. It should be noted that the proposed development is expected to generate a total of 44 additional PCUs during the peak hours. This should be considered in light of the current traffic volumes on the R623 to the north of the Ballytrasna Park junction.

The R623 carries a total traffic flow of 1,418 PCUs in the AM Peak Hour and 1,751 PCUs during the PM Peak Hour in this location. An additional 46 PCUs equates to an impact of less than 5% during each of the commuter peak hour

TII's Traffic and Transportation Assessment Guidelines recommends that a threshold assessment & analysis is undertaken to determine the increases in traffic associated with any particular development, and whether this might be considered as significant. For developments to be located in areas with roads that are considered as 'congested', the Guidance recommends the use of threshold-levels of traffic increase of 5%, which if exceeded require further assessment to be undertaken. The

Threshold level is set at 10% for uncongested conditions. It is clear based on our assessment that the proposed development will have a negligible impact to the north of the Ballytrasna Park junction.

Based on the recent comprehensive Traffic Data Collection and Surveys, and utilising the Traffic Generation Figures, a Threshold Assessment was undertaken. A summary of Opening Year Threshold Impact on each affected road/junction is as follows;

N25 Carriageway East

- 0.6% (ie 0.6 of 1%) impact in the weekday AM Peak Hour,
- 1.6% impact in the weekday PM Peak Hour.

N25 Carriageway West

- 0.4% (ie 0.4 of 1%) impact in the weekday AM Peak Hour,
- 0.7% (ie 0.7 of 1%) impact in the weekday PM Peak Hour.

R623/N25 Off/On Slip Traffic Signals at Northside of N25

- 2.3% impact in the weekday AM Peak Hour,
- 2.9% impact in the weekday PM Peak Hour.

R623/N25 Off/On Slip "An Crompan" Roundabout at Eastgate Ave

- 2.5% impact in the weekday AM Peak Hour,
- 2.9% impact in the weekday PM Peak Hour.

R623/ Ballytrasna Road Traffic Signal Controlled Junction

- 5.2% impact in the weekday AM Peak Hour,
- 4.5% impact in the weekday PM Peak Hour.

These worst-case traffic increases are below the TII guideline and industry standard level above which further assessment is required. To set these increased levels of traffic in context, the day to day variation in traffic volume (due to day of week or weather conditions) is accepted as being 10%, so in this context alone, increases of approximately 5% will go entirely unnoticed. Notwithstanding the above, a detailed assessment of the Business Park Vehicular access junction and the Ballytrasna Park/R623 Traffic Signal Controlled junction was undertaken using industry standard simulation modelling packages.

14.7.1 Harbour Point/Ballytrasna Park Priority Junction

The TII-approved software package 'Junctions 9' PICADY' (**P**riority **I**ntersection **C**apacity and **D**ela**y**) software package (as part of the TRL Package 'Junction 9') has been utilised to inform this assessment and to confirm that the small increases in traffic associated with the construction of the facility can be accommodated. PiCADY produces results based on a ratio of flow to capacity (RFC) and queue length. An RFC greater that 1.00 indicates that a junction is operating at or above capacity, with 0.85 considered to be the optimum RFC value.

The detailed computer simulation model results (PiCADY Outputs) of the junction modelling are provided in **Appendix 14.2, EIAR Volume II**. A summary of the results is reproduced below as Table 14.3

Table 14.3: Ballytrasna Park/Harbour Point Access Junction– Summary PiCADY Results, Worst Case Weekday AM and PM Commuter Peak Hours 2019 and 2034

Modelled Scenario	Period Mean Max Q (in PCUs)	Max RFC
2021 AM Peak Hour	1	0.44
2021 PM Peak Hour	1	0.45
2036 AM Peak Hour	2	0.52
2036 PM Peak Hour	2	0.53

The results of the modelling clearly show that the existing junction will have more than adequate capacity to accommodate the worst case traffic associated with the recycling facility. All of the RFCs are below the theoretical capacity of 0.85 and no unacceptable queuing is anticipated. The results demonstrate that any potential increase form the proposed development is negligible and that the junction could accommodate significantly higher traffic volumes (possibly more than several multiples of the volume) without any capacity related problems arising.

14.7.2 Ballytrasna Park/R623 Traffic Signal Controlled Junction

The TII-approved software package LiNSiG (Linked Signal Design) software package was utilised to confirm that the small increases in traffic associated with the construction of the facility can be accommodated at the existing junction. LiNSIG produces results based on a Degrees of Saturation (DoS) and Mean Maximum queue length. A DoS greater that 100% indicates that a junction is operating at or above maximum capacity, with 90% considered to be the optimum DoS value. The results of the modelling are included herein as **Appendix 14.3**, **EIAR Volume II** and are summarised below as Table 14.4

Table 14.4: Ballytrasna Park/R623 Junction– Summary LiNSiG Results, Worst Case Weekday AM and PM Commuter Peak Hours 2019 and 2034

Modelled Scenario	Max DoS (%)
2021 AM Peak Hour	55.1
2021 PM Peak Hour	89.3
2036 AM Peak Hour	65.7
2036 PM Peak Hour	85.2

The above analysis confirms that the operation of the recycling facility will have a negligible impact upon the capacity of the road network in the area and can easily be accommodated without any impact arising.

14.8 Conclusions

This transportation assessment assesses the traffic impact of the proposed waste transfer and recycling facility within the confines of Harbour Point Business Park. This assessment has been prepared in accordance with TII's Traffic & Transport Assessment Guidelines, and provides an onerous and robust assessment of the impact of the proposed development.

This assessment demonstrates that the proposed development will have an unnoticeable impact upon the established local traffic conditions and can easily be accommodated on the road network, conscious of the established busy conditions within Little Island generally.

The addition of a total of worst case 46 car equivalent movements during the peak hour is considered to have a negligible effect. The capacity of the key junctions has been assessed using proprietary modelling tools and this confirms that adequate capacity exists.

A review of the Road Safety Authority database records indicates that there is no history of any reported accidents whatsoever in the area. In this regard, given the very low additional traffic volumes, it is concluded that the development will not have any adverse impact upon traffic safety. It is considered that there are no significant operational traffic safety or road capacity issues, affecting the established vehicular access or the established road network that prevent a positive determination of the application by Cork County Council.

15 Chapter Fifteen – Consideration of Alternatives

15.1 Introduction

The Planning and Development Regulations 2001-2015 as amended, specifies the information to be contained within an EIAR. Schedule 6 1(d) specifies that an EIAR shall include *"An outline of the main alternatives studied by the developer and an indication of the main reasons for his or her choice taking into account the effects on the environment."* The 2014 EIA Directive 2014/51/EU (Article 5 paragraph 1d) also outlines the requirement for "*A description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment."*

This chapter reviews the potential options assessed by CCR as development options and provides the reasoning and evidence base as to why the proposed development site in Little Island will result in the least environmental impact.

15.2 Competent Expertise

The consideration of Alternatives Chapter was completed by David Heelan of OES Consulting. David possesses a BA (hons) form University College Dublin specialising in History and Archaeology and also an Msc. in Regional and Urban Planning from Heriot Watt University, Edinburgh and is a chartered town planner with the Royal Town Planning Institute (RTPI). David has worked as an environmental consultant and town planner since 2008 and has produced numerous alternatives assessments, socio economic assessment and human health assessments for a diverse range of developments such as wind farms, roads, bridges, creameries, schools and hydro-electric power plants throughout Ireland, and the United Kingdom.

15.3 Guidance on Assessing Alternatives

Guidance documents produced by the Agency[5][6] provide direction in interpreting the requirements for the evaluation of alternatives. The EIA Directive 2014/52/EU requires an EIAR to contain:

'A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.'
This equates to "A description of the reasonable relevant alternatives studied by the developer and an indication of the main reasons for the option chosen" as detailed in the Key Issues Consultation Paper issued by the Department of Housing, Planning, Community and Local Government (DHPCLG) on the administrative provisions in advance of transposition of the Directive into Irish Law on 2nd May 2017.

The 2017 Guidelines issued by the EPA[7] (page 36) focus the assessment of alternatives on a number of key issues including:

1. 'Do-Nothing' Alternative

[5] Guidelines on the Information to be Contained in Environmental Impact Statements, Environmental Protection Agency, 2017
[6] Advice Notes for Preparing Environmental Impact Statements, Environmental Protection Agency, 2015
[7] Guidelines on the Information to be Contained in Environmental Impact Statements, Environmental Protection Agency, 2017

The range of alternatives can include a 'do-nothing' alternative where appropriate. This examines trends currently occurring at the site, for example likely land use changes or other interventions, the likely effects of climate change, and the significance of these changing conditions. It can be particularly useful when assessing effects caused by projects which themselves are designed to alleviate environmental or infrastructural problems, e.g. waste treatment facilities, flood relief projects, road building, etc.

2. Alternative Locations

Some locations have more inherent environmental sensitivities than others. Depending on the type of project and the range of alternatives which the developer can realistically consider, it may be possible to avoid such sites in favour of sites which have fewer constraints and more capacity to sustainably assimilate the project. It can be useful to ensure that a range of options, that may reasonably be available, are included in the evaluation.

3. Alternative Layouts

Alternative layouts can often be devised to consider how different elements of a proposal can be arranged on a site, typically with different environmental, as well as design implications.

4. Alternative Designs

Many environmental issues can be resolved by design solutions that vary key aspects such as the shape of buildings or the location of facilities. Where designers are briefed at an early stage on environmental factors, these can be considered during the design development process, along with other design parameters.

5. Alternative Processes

Within each design solution there can be several different options as to how the processes or activities of the project can be carried out, e.g. the management of processes that affect the volumes and characteristics of emissions, residues, traffic and the use of natural resources.

15.4 Reasonable Relevant Alternatives Assessed

As per Article 5(1) of the 2014 directive this section includes 'a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment'. There are four main reasonable relevant alternatives and a preferential option that are therefore reviewed in this Chapter to comply with the EPA Guidance produced in 2002 and 2015 and the requirements of the 2014 Directive:

- Do Nothing Scenario;
- Alternative Location where the facility develops another site;
- Alternative Layout and Design;
- Alternative Processes – Changing the processing methods on site, and a
- Preferential Option: Planning and EIA for the Proposed Waste Transfer and Recycling Facility.

A review of each of these alternatives is discussed below.

15.4.1 Do Nothing Scenario

This section of the assessment outlines '*the likely evolution of the current state of the environment without implementation of the project (baseline scenario*)' (paragraph 31, Directive 2014/52/EU). The Do-Nothing Scenario would result in no development occurring on the proposed site and no activity taking place.

As discussed in Chapter 3 above, a need for waste processing and recycling infrastructure exists within the south west of the country to reduce national and regional dependence on landfill and the levels of waste currently going to landfill or being exported out of the country for disposal.

Current national waste policy acknowledges that strides must be taken to reduce the country's dependence on landfill whilst also maximising the capabilities of separation, recycling and reuse facilities whilst the Regional Planning Guidelines for the Southwest Region state in section 5.6.17 that there is the need for a Materials Recovery Facility (MRF) or Mechanical Biological Treatment (MBT) to be developed, at an early date, within the Cork Gateway, which has good transportation links.

The proposed development seeks to meet the aims of national and regional waste policy and a decision to do nothing at the Little Island would prevent much needed infrastructure being introduced which will aid in reaching national and regional objectives. The requirement to introduce such a facility at the proposed development site has been identified by the approval of planning permission for a similar facility in 2008 by Cork County Council.

The proposed development site is not located within a designated ecological site, consisting of unmanaged grasslands with an absence of aquatic ecological habitats or rivers. There are also no known archaeological or cultural heritage records within the site boundary, as discussed above in Chapter 10.

Due to an absence of ecological, hydrological, archaeological and other environmental features onsite, a do nothing scenario would not lead to an increased level of protection for such features within Little Island and the surrounding areas. Such a scenario would also potentially prevent much needed waste infrastructure from being delivered within the south west to reduce waste streams for disposal and ultimately landfill.

15.4.2 Alternative Location

The proposed development site is located on lands zoned as industrial/business with an existing planning permission for a similar type facility. However, CCR undertook a detailed site selection process before deciding to progress with a design and planning application for the proposed Little Island site. An assessment of alternative sites and the reasoning behind the selection of a preferred option must be based on environmental factors as well as commercial and land access decisions.

A number of alternative sites within different parts of the Cork City environs were assessed as potential options for the development other than Little Island. The following options were proposed but were ruled for environmental impact and commercial reasons:

<u>Ringport Business Park, Ringaskiddy, Co. Cork</u>

A number of indicative locations were assessed within Ringport Business Park however the acquiring of a suitably large site with existing road access infrastructure was problematic to identify, and the development of such features such as sightlines and junction access arrangements would have increased the potential environmental impact of the project on the surrounding lands. A number of potential sites to the west of the existing buildings of the Business Park and further west across the

Old Post Office Road were assessed but were found to be located in close proximity to the existing residential properties lining the Old Post Office Road with a number of houses located on the boundary of the proposed sites being assessed and a larger number within 50m.

The proposed waste facility has been designed to prevent adverse noise, air quality, odour and amenity impacts on local residents, as discussed throughout this EIAR, however, the proximity of these houses was deemed as an unsuitable neighbouring land use for an industrial waste facility as it was known that more suitable sites with neighbouring industrial and business uses were available throughout Cork City. The route of the proposed M28 shown in the Ballincollig/Carrigaline Municipal District Local Area Plan also runs though a number of industrial sites at this location which rule them out for development purposes. It was not possible for CCR to enter into negotiations with local land owners for land use and access agreements for suitably located and large land parcels within the area. The land that was potentially available to CCR was assessed as not suitable for a waste facility at this location.

Ballincollig Commercial Park, Carrigrohane, Ballincollig, Co. Cork

CCR assessed the possibility of developing the proposed facility at a site located within the Ballincollig Commercial Park, however the site was factored out of consideration for a number of reasons. The existing built up nature of the commercial park along with the surrounding residential development on all sides provided very little flexibility in relation to site selection, design and use suitability. The Commercial Park is surrounded on all sides by areas of residential development with a significant level of road users at peak times identified. An existing baseline of high levels of traffic and wait times surrounding the Commercial Park approach roads would hinder the ability of a proposed waste site to operate. The Commercial Park is also zoned as an "Existing Built Up Area" within the Ballincollig/Carrigaline Municipal District Local Area Plan with no specific industrial/business zoned lands proposed within this area. It was viewed by CCR that a site zoned for industrial/business use would be more suitable from a planning policy perspective for the proposed development with a higher level of compliance with county and local planning policies. The high levels of surrounding residential development surrounding the Commercial Park were also not deemed as the preferred neighbouring land use for a waste transfer site for the reasons discussed above in relation to the Ringport Business Park option, especially when more suitable sites are available with the Cork City environs. For these reasons Ballincollig Commercial Park was ruled out as a development option.

CCR did investigate the possibility of developing other sites within the Cork City Environs such as the Sunbeam Industrial Estate, but was unable to secure a commercial land agreement on a site which would result in fewer environmental impacts than the selected Little Island site.

15.4.3 Alternative Layout and Design

A number of site layout and building design changes have been implemented by CCR to incorporate CCC planning policy objectives for the site and to ensure the proposed waste transfer building integrated well into the backdrop of existing industrial buildings.

The permitted waste facility on the site (planning application 07/10229) had a roof peak height of 14.5m. CCR sought to ensure the proposed development would integrate into the existing industrial backdrop and would not protrude out of the existing rooflines from certain views surrounding the site. A decision was taken to reduce the height of the proposed roof levels at an early stage of the project design to 12.8m to reflect the slope of the site and the heights of surrounding industrial units. Viewpoints 5 and 7 provided above in Chapter 12 show that the reduced height of the waste transfer station and the selection of a building cladding colour to reflect neighbouring building facades ensures

the proposed development will blend into the existing visual backdrop and will not result in adverse impacts on views of Little Island from across Lough Mahon

At a pre-application consultation meeting in September 2017, members of CCC Planning Department emphasised the importance of implementing a 20m tree buffer on the western boundary of the site to meet the requirements of Site Objective LI-I-02 as discussed above in Chapter 3. CCR sought to increase the width of the buffer that was originally proposed and extended the area of trees within the site project design to a 20m width. This measure required the movement of a number of site structures and proposed internal site traffic movements from this area of the site to accommodate this landscape screening feature.

15.4.4 Alternative Process

The aim of the proposed development is to introduce alternative waste processing and waste reduction processes in Cork which will reduce the levels of household, commercial and other wastes going to landfill. The facility does not serve a disposal function, rather it will reduce the levels of waste going to landfill and separate out as much re-usable material as possible from the different waste streams. The facility will process non-hazardous waste only through mechanical separation and will not operate chemical and combustion processes onsite such as gasification or pyrolysis. In this regard, the site aims to be as clean and efficient as possible in the separation of waste and therefore proposes to utilise mechanical separation which involves no chemical and combustion processes. Mechanical separation will not result in environmental impacts on site or increase the risk of hazards or accidents on site in comparison with other combustion/chemical processes unitised on other sites.

15.4.5 Preferred Site

The Little Island site was identified as the most suitable and appropriate site for the proposed development from an environmental impact, commercial and land use perspective.

The development of the Little Island site supports the aims of the Cork County Development Plan (CCDP) for Little Island as a Strategic Employment Area. Section 11.7.4 of the CCDP states that the provision of strategic large scale waste treatment facilities will be considered in 'Industrial Areas' designated as Strategic Employment Areas similar to the Little Island site. As mentioned in **Chapter 3** above, the proposed site is also zoned for industrial use within the Cobh Municipal District Local Area Plan.

The granting of planning permission for a similar facility in 2008 on the proposed development site highlighted to CCR that Cork County Council view the site as suitable for a waste transfer and recycling use (reference number 07/10229). The site is also viewed by CCR as the most suitable and appropriate location for a number of reasons discussed below.

From an environmental impact perspective the location and nature of the development site holds a number of key benefits over the alternative sites assessed and discussed above. The site avoids a number of key impacts as it is not situated within or directly adjacent to a designated ecological site and the habitats within the proposed development site are considered to be of low ecological value. Those habitats considered to be of high local importance (hedgerows, and treeline) will be retained throughout the lifetime of the project.
No plant species of conservation concern are likely to occur in proximity to the proposed development whilst there is also an absence of aquatic habitats within the site including rivers and streams. As discussed above in **Chapter 5**, rabbits were the only mammal species recorded within the proposed development site, though fox and hare are also likely to utilise those habitats that occur on site.

Common bird species were recorded in low numbers during each site visit. The Biodiversity assessment provided in **Chapter 5** determined that the habitats within the proposed development do not provide suitable habitat for those species listed as Special Conservation Interests for the Cork Harbour SPA. The development of a waste transfer and recycling facility at the site will result in the permanent loss of dry meadows and grassy verges, recolonising bare ground. Based on the low value of these habitats to species of conservation concern the biodiversity assessment completed in **Chapter 5** determined this impact to be imperceptible.

The proposed development site is surrounded by industrial and business premises. Residential properties are not located on or adjacent to the site boundary or within the neighbouring lands. The nearest residential receptor is located over 320m to the east and is an individual dwelling on the eastern boundary of the Business Park, as shown on **Figure 1.3, EIAR Volume III**.

As mentioned in **Chapter 14** above, the surrounding roads have more than adequate capacity for the small additional traffic that will be generated by the proposed development, which will have an unnoticeable impact upon the established local traffic conditions and can easily be accommodated on the road network. Site traffic will have easy access to the N25 closeby to the north and the national road network, reducing the level of journeys HGVs will take on smaller, more constrained roads.

The industrial/business backdrop of Harbour Point Business Park will enable the proposed facility to be integrated into the existing visual landscape, with the 12.8m building height designed to reflect similar neighbouring structures. Such integration would not be possible in other locations surrounded by smaller scale housing development.

15.5 Summary

The location of the proposed facility on a site with few identified environmental features of interest and where the use for a waste facility has already been permitted by Cork County Council is considered a very favourable location for waste management infrastructure. The proposed development will complement the existing surrounding business/industrial land uses and will not result in adverse impacts on the amenity of local residents and their ability to enjoy outdoor spaces. Development at the selected preferred site option in Little Island will result in a significantly lower level of potential environmental impacts in comparison with other sites discussed in this chapter.

16 Chapter 16 – Interactions

16.1 Introduction

As outlined in Article 3(1e) of Directive 2014/52/EU an EIAR is required to assess the interactions between topics/factors discussed as part of the EIA i.e. population and human health, biodiversity, land, soil, water air and climate, material assets, cultural heritage and landscape where relevant.

The Planning and Development Regulations 2001 to 2015 Schedule 6 Part 2 (b) require an Environmental Statement to include:

A description of the aspects of the environment likely to be significantly affected by the proposed development, including in particular:

- *Human beings, fauna and flora,*
- *Soil, water, air, climatic factors and the landscape,*
- *Material assets, including the architectural and archaeological heritage, and the cultural heritage;*
- *The inter-relationship between the above factors;*

This chapter describes and assesses the inter relationships between the different potential impacts of the proposed development. The identified technical inter-relationships are provided below.

16.2 Noise, Human Health and Biodiversity

Noise has the potential to impact upon the amenity enjoyed by residents living within Little Island and disturb the habits of natural species surrounding a development.

The noise assessment discussed above in Chapter 8 concluded that the proposed development will not give rise to significant adverse noise related effects on nearby noise sensitive locations. Operation of the Little Island waste facility will result in new noise sources becoming operational in the Courtstown Industrial Park. However, the limits and conditions of the waste licence will be complied with at a minimum. The facility is not located in a quiet area or area of low background noise levels. Therefore, the effect is not deemed to be significant.

Noise resulting from the construction and operation of the proposed development will not result in significant adverse impacts on biodiversity. The biodiversity assessment included within Chapter 5 above concluded that noise sensitive fauna such as birds that occur within the SPA are highly unlikely to occur within or in close proximity to the development site due to the absence of suitable habitat. The habitats present onsite are also of low value to terrestrial mammal species and no protected mammal species were recorded within the site. Bats are likely to forage along hedgerow and treeline habitats along the site perimeter, and the adjacent woodland habitat to the west of the proposed development site, however there is an absence of suitable bat breeding sites within proximity to the waste transfer and recycling facility site.

Construction noise and increased human activity (including heavy vehicular access) are likely to result in the temporary displacement of birds and mammals from the immediate surroundings. This is considered a short-term imperceptible negative impact due to the high background levels of disturbance from the existing industrial development in the area and the absence of species of conservation concern from the area around the proposed waste transfer and recycling facility development.

16.3 Air Quality, Human Health and Biodiversity

A significant decrease in air quality and the emission of harmful contaminants can pose a risk to the health of human beings and animals over periods of time. A decrease in air quality such as the production of harmful emissions or strong odours can also reduce the outdoor amenity for local residents enjoying outdoor spaces such as gardens and parks.

The proposed development will not result in significant impacts on local air quality or produce emissions that would have the potential to impact on local air quality. Operations at the site are limited to manual and mechanical sorting and separation, baling and other sorting related activities. No combustion, gasification or pyrolysis processes will occur onsite and emissions from such activities will not be present onsite.

Emissions from the proposed development will be limited to the extraction of treated air via the onsite stack from the internal areas of the processing building. No combustion exhausts are proposed at the site. The facility and operational processes have been designed to prevent odour impacts and emissions occurring at the site. All waste processing, sorting and baling will be undertaken within the facility building itself, with a negative air pressure and an odour extraction and treatment unit operating within the building. Storage of waste materials outside of the building will not occur, further reducing the potential for odour emissions from waste on site. It is not envisaged that the proposed facility will impact on local air quality or generate adverse odours and will not impact on the health of the local population or biodiversity within Little Island and the surrounding area.

A detailed air quality assessment has been undertaken to determine the impact on local air quality resulting from the operation of the proposed Little Island waste facility site in terms of emissions to air.

Operations at the facility will not be permitted to commence until the formal waste permit/ licence is provided to CCR. The absence of industrial combustion equipment and waste processing which would produce significant emissions and odours onsite will ensure that adverse impacts on local air quality and odours will not occur on site and will not negatively impact on local residents and biodiversity.

16.4 Landscape and Visual and Human Health

Developments have the potential to cause adverse impacts on the local and regional visual landscape and as a result can reduce visual amenity for local residents. Negative impacts on views from windows and outdoor spaces such as back gardens can reduce the enjoyment of specific views valued by local residents. The landscape and visual assessment completed as part of Chapter 12 assessed the impact of the proposed development on local views, selecting seven key viewpoints surrounding Little Island. The assessment determined that the proposed development will not incur any significant impacts in respect of local landscape character or sensitive visual receptors in the environs of the site, i.e. local or distant residents or users of the surrounding road network infrastructure. The absence of adverse impacts reflects the manner in which the proposed development will be integrated among similar developments on the business park and the mitigating effect of distance in views from residential areas and the road network around the harbour.

Amenity users such as visitors and local residents enjoying garden spaces, open windows and the general environs of Little Island will not be negatively impacted by the proposed development with no decrease in amenity enjoyment.

16.5 Water Quality and Ecology

Development projects have the potential to result in adverse impacts on local hydrology such as rivers and streams if they are constructed without consideration for the protection of such natural features. Contamination, pollution, erosion or development within hydrological features can have a knock on negative impact on the species and habitats within and surrounding rivers and streams.

The proposed development will not result in any adverse impacts on local hydrological features or on the fauna and flora which avail of the available natural water resources.

There are no rivers or streams within or in the immediate vicinity of the development site and due to this absence of watercourses, the site is unlikely to be of value to amphibians or aquatic species. The northern boundary of the proposed site contains a drainage ditch which is associated with improvements for agricultural purposes. The open ditch is generally in a somewhat degraded condition and inundated with vegetation but appears effective in draining surface water towards the existing industrial properties to the east, discharging to the adjacent storm water network in the industrial estate. There are no other surface water features on the site. This drainage ditch will be protected and maintained during the construction and operational phases of the development with a development free buffer zone implemented along the banks of the ditch to protect from spillages and contamination from construction materials. This will ensure protection of any flora and fauna either living within the ditch or using it for feeding or travelling through the site. No other hydrological features will be at risk within the Little Island site during both the construction and operational phases.

It is considered that the operation of the development will have negligible or no variation to hydrology and water quality on and surrounding the site. The vast majority of the site in which process activities will take place will be located on made ground and hard standing. Site infrastructure has been designed to include sufficient site drainage to divert and control any potential spills or leaks which may otherwise enter soils or groundwater.

The EIAR has concluded that the proposed development will not result in any adverse impacts on local hydrological features and as a result will not adversely impact on the fauna and flora which avail of the natural water resources.