

12.0 MATERIAL ASSETS: WASTE MANAGEMENT

12.1 Introduction

This chapter evaluates the likely impacts, if any, which the development may have on Material Assets (related to waste management) as defined in the EIA Directive (Directive 2011/92/EU as amended by Directive 2014/52/EU) and the Environmental Protection Agency (EPA) Guidelines on the information to be contained in Environmental Impact Assessment Reports (2022).

This chapter has also been prepared to address the issues associated with waste management during the construction and operational phases of the development as described in Chapter 3 (Description of Historic Development).

This chapter was completed by Chonaill Bradley and Laura Berry of AWN Consulting Ltd.

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A site-specific Resource & Waste Management Plan (RWMP) has been prepared by AWN Consulting Ltd. to deal with resource use and waste generation during the excavation and construction phases of the development and has been included as Appendix 12.1 of this EIAR. The RWMP was prepared in accordance with the Environmental Protection Agency's (EPA) document 'Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021).

These documents ensure the sustainable management of wastes arising at the development site in accordance with the legislative requirements and best practice standards.

12.1.1 Legislation and Guidance

Waste management in Ireland is subject to EU, national and regional waste legislation, which defines how waste materials must be managed, transported and treated. The overarching EU legislation is the 'Waste Framework Directive (2008/98/EC)' as amended, which is transposed into national legislation in Ireland. The cornerstone of Irish waste legislation is the 'Waste Management Act 1996 (as amended)'. European and national waste management policy is based on the concept of 'waste hierarchy', which sets out an order of preference for managing waste (prevention > preparing for re-use > recycling > recovery > disposal) (**Figure 12.1**).



Figure 12.1: Waste Hierarchy (Source: European Commission)

EU and Irish national waste policy also aims to contribute to the circular economy by extracting high-quality resources from waste as much as possible. Circular Economy (CE) is a sustainable alternative to the traditional linear (take-make-dispose) economic model, reducing waste to a minimum by reusing, repairing, refurbishing and recycling existing materials and products (**Figure 12.2**).

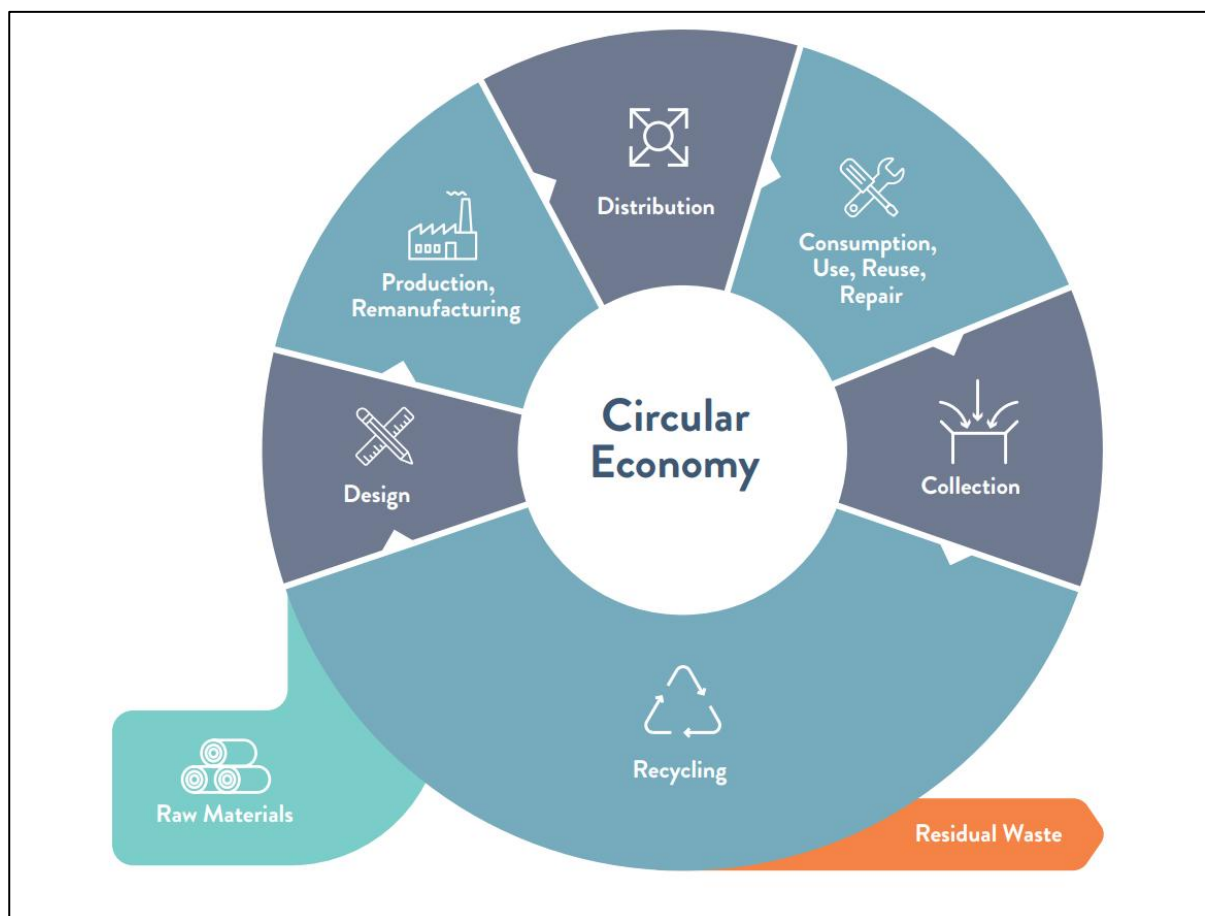


Figure 12.2: Circular Economy (Source: EPA)

The Irish Government issues policy documents which outline measures to improve waste management practices in Ireland and help the country to achieve EU targets in respect of recycling and disposal of waste. The policy document, 'Waste Action Plan for a Circular Economy – Waste Management Policy in Ireland' (WAPCE), was published in 2020 and shifts focus away from waste disposal and moves it back up the production chain. The move away from targeting national targets is due to Irish and international waste context changing in the years since the launch of the previous waste management plan, 'A Resource Opportunity', in 2012.

One of the first actions to be taken from the WAPCE was the development of the Whole of Government Circular Economy Strategy 2022-2023 'Living More, Using Less' (2021) to set a course for Ireland to transition across all sectors and at all levels of Government toward circularity and was issued in December 2021.

The Circular Economy and Miscellaneous Provisions Act 2022 was signed into law in July 2022. The Act underpins Ireland's shift from a "take-make-waste" linear model to a more sustainable pattern of production and consumption, that retains the value of resources in our economy for as long as possible and that will significantly reduce our greenhouse gas emissions. The Act defines Circular Economy for the first time in Irish law, incentivises the use of recycled and reusable alternatives to wasteful, single-use disposable packaging, introduces a mandatory segregation and incentivised charging regime for commercial waste and streamlines the national processes for End-of-Waste and By-Products decisions.

The National Waste Management Plan for a Circular Economy 2024-2030 (2023) has been published and replaces the Regional Waste Management Plans. The Plan sets out a framework for the prevention and management of waste in Ireland for the period 2024 to 2030.

This Plan recognises Climate Change as a key driver for both behavioural change and improved waste management practices. The ambition of this Plan is 0% total waste growth per person over the life of the Plan with an emphasis on non-household wastes including waste from commercial activities and the construction and demolition sector. This ambition is underpinned with a comprehensive series of targets, policies, actions and a suite of key deliverables.

National End-of-Waste Decision EoW-N001/2023 establishes criteria determining when recycled aggregate resulting from a recovery operation ceases to be waste.

The strategy for the management of waste from the construction phase is in line with the requirements of the 'Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction and Demolition Projects' document, produced by the EPA in November 2021. The guidance document 'Construction and Demolition Waste Management: A Handbook for Contractors and Site Managers' (FÁS & Construction Industry Federation 2002) was also consulted in the preparation of this assessment.

There are currently no Irish guidelines on the assessment of operational waste generation, and guidance is taken from industry guidelines, plans and reports including:

- The National Waste Management Plan for a Circular Economy 2024 – 2030 (NWMPCE) (2024),
- BS 5906:2005 Waste Management in Buildings – Code of Practice,
- County Of Carlow (Segregation, Storage and Presentation of Household and Commercial Waste) Bye-Laws, 2018,
- EPA National Waste Database Reports 1998 – 2020,

- The Circular Economy and National Waste Database Report 2021-2022 (2024) and
- the EPA National Waste Statistics Web Resource.

12.1.2 Terminology

Note that the terminology used herein is generally consistent with the definitions set out in Article 3 of the Waste Framework Directive. Key terms are defined as follows:

- **Waste:** Any substance or object which the holder discards or intends or is required to discard.
- **Prevention:** Measures taken before a substance, material or product has become waste, that reduce:
 - (a) the quantity of waste, including through the re-use of products or the extension of the life span of products;
 - (b) the adverse impacts of the generated waste on the environment and human health; or
 - (c) the content of harmful substances in materials and products.
- **Reuse:** Any operation by which products or components that are not waste are used again for the same purpose for which they were conceived.
- **Preparing for Reuse:** Checking, cleaning or repairing recovery operations, by which products or components of products that have become waste are prepared so that they can be re-used without any other pre-processing.
- **Treatment:** Recovery or disposal operations, including preparation prior to recovery or disposal.
- **Recovery:** Any operation the principal result of which is waste serving a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in the plant or in the wider economy. Annex II of the Waste Framework Directive sets out a non-exhaustive list of recovery operations.
- **Recycling:** Any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.
- **Disposal:** Any operation which is not recovery even where the operation has, as a secondary consequence, the reclamation of substances or energy. Annex I sets out a non-exhaustive list of disposal operations.
- **Circular Economy:** A model of production and consumption, which involves sharing, leasing, reusing, repairing, refurbishing and recycling existing materials and products as long as possible.

12.2 Method

The assessment of the impacts of the Development, arising from the consumption of resources and the generation of waste materials, was carried out, taking into account the methodology specified in relevant guidance documents, along with an extensive document review to assist in identifying current and future requirements for waste management; including national and regional waste policy, waste strategies, management plans, legislative requirements and relevant reports.

This chapter is based on the development, as described in Chapter 3 (Description of Historic Development) and considers the following aspects:

- Legislative context;
- Construction phase (including pre operational excavation and site preparation); and
- Operational phase.

A desktop study was carried out, which included the following:

- Review of applicable policy and legislation which creates the legal framework for resource and waste management in Ireland;
- Description of the typical waste materials that should have been generated during the construction and operational phases; and
- Identification of mitigation measures to prevent waste generation and promote management of waste in accordance with the waste hierarchy.

Estimates of waste generation during the construction phases of the Development have been calculated. The waste types and estimated quantities are based on published data by the EPA in the National Waste Reports and National Waste Statistics, data recorded from similar previous developments, Irish and US EPA waste generation research as well as other available research sources.

Mitigation measures are proposed to minimise the effect of the Development on the environment during the construction phases, to promote efficient waste segregation, and to reduce the quantity of waste requiring disposal. This information is presented in **Section 12.5**.

A detailed review of the existing ground conditions on a regional, local and site-specific scale is presented in Chapter 7 (Land, Soils, Geology & Hydrogeology).

12.3 Difficulties Encountered

In assessing effects which have occurred, by its nature, this rEIAR is assessing those effects many years after the project construction. As a result, there may be both undocumented instances of minor effects which are not captured by this rEIAR in addition to gaps in the historical data available. These limitations have been taken into account during this assessment process.

12.4 Baseline Environment

In terms of waste management, the receiving environment is largely defined by Carlow County Council as the local authority responsible for setting and administering waste management activities in the area. This is governed by the requirements set out in the NWMPCE 2024 – 2030 and the WAPCE.

The waste management plans set out the following targets for waste management in the region:

- Achieve a recycling rate of 55% of managed municipal waste by 2025; and
- Reduce to 0% the direct disposal of unprocessed residual municipal waste to landfill (from 2016 onwards) in favour of higher value pre-treatment processes and indigenous recovery practices.

The Regional Waste Management Planning Offices have issued a National Waste Management Plan for a Circular Economy 2024 - 2030 (NWMPCE) in March 2024, which supersedes the Southern Regional (SR) waste management plan and the two other regional waste management plans. The NWMPCE does not however dissolve the three regional waste areas. The NWMPCE sets the ambition of the plan to have a 0% total waste growth per person over the life of the Plan with an emphasis on non-household wastes including waste from commercial activities and the construction and demolition sector.

The Carlow County Development Plan 2022 – 2028 sets out the objectives for the CCC area which reflect those set out in the regional waste management plan and can be found in Appendix 12.1.

In terms of physical waste infrastructure, CCC no longer operates any municipal waste landfill in the area. There are a number of waste permitted and licensed facilities located in the SR Waste Region for management of waste from the construction industry as well as municipal sources. These include soil recovery facilities, inert C&D waste facilities, municipal waste landfills, material recovery facilities and waste transfer stations.

12.4.1 Demolition Phase

There is no demolition associated with the development and as such there is no demolition waste generated.

12.4.2 Construction Phase

There was no physical construction of buildings or installation of services as part of this development and as such there was no standard construction waste to be generated. Construction for this project refers to the general clearance of overburden and the installation of temporary, portable structures.

There was soil, stones and clay excavated to facilitate construction of the development and as part of normal quarrying practices. It is understood that excavated material was sold as product and where excavated material was not of product standard it was retained and reused onsite for landscaping and backfill fill. When any of the remaining material was deemed unsuitable for reuse it, was removed offsite. This material was taken for appropriate offsite reuse, recovery, recycling and / or disposal.

If the material was deemed unsuitable for reuse and requires removal from site it was deemed to be a waste, removal and reuse / recycling / recovery / disposal of the material should have been carried out in accordance with the 'Waste Management Act 1996' (as amended), the 'Waste Management (Collection Permit) Regulations 2007' as amended, and the 'Waste Management (Facility Permit & Registration) Regulations 2007' as amended. The volume of waste requiring recovery / disposal would have dictated whether a Certificate of Registration (COR), permit or license is required for the receiving facility. Alternatively, the material may be classed as by-product under Article 27 classification (European Communities (Waste Directive) Regulations 2011, S.I. No. 126 of 2011), as amended'.

In order to establish the appropriate reuse, recovery and / or disposal route for the soils and stones to be removed off-site, it was first required to be classified. Waste material was initially need to be classified as hazardous or non-hazardous in accordance with the EPA publication 'Waste Classification – List of Waste and Determining If Waste is Hazardous or Non-Hazardous'. Environmental soil analysis should have been carried out prior to removal of the material on a number of the soil samples in accordance with the

requirements for the acceptance of waste at landfills (Council Decision 2003/33/EC Waste Acceptance Criteria). This legislation sets limit values on landfills for acceptance of waste material based on properties of the waste including potential pollutant concentrations and leachability.

Waste was also be generated from construction phase workers e.g. organic / food waste, dry mixed recyclables (wastepaper, newspaper, plastic bottles, packaging, aluminium cans, tins, Tetra Pak cartons) and mixed non-recyclables from temporary welfare facilities provided on-site during the construction phases. Waste electrical and electronic equipment (WEEE) and waste batteries may also be generated infrequently from site personnel.

Further details on the waste materials likely to be generated during the excavation and construction works are presented in the project-specific RWMP.

12.4.3 Operational Phase

The development gave rise to a wide variety of waste streams during the operational phase, i.e. when the project is completed, open and occupied. Operational waste was be generated on a daily basis by the operator.

Waste volumes generated on site are low and primarily consist of the following waste streams that did derive from either the canteen or the maintenance of on-site mobile plant:

- LoW/EWC 20 01 08 biodegradable kitchen and canteen waste (5kg per week)
- LoW/EWC 20 03 01 mixed municipal waste (20kg per week)
- LoW/EWC 16 01 07* oil filters (20kg per week)
- LoW/EWC 16 01 13* brake fluids (25L per week)
- LoW/EWC 16 01 99 wastes not otherwise specified (20kg per week)
- LoW/EWC 13 05 03* interceptor sludges (20kg per week)

12.4.3.1 Segregation of Waste Materials Onsite

All waste materials should have been segregated into appropriate categories and should have been stored in appropriate bins or other suitable receptacles in a designated, easily accessible areas of the site. All wastes generated by the servicing and maintenance of plant is immediately removed from site by the service contractor. Sludges from the on-site interceptor is removed on a regular basis (at least annually) by a suitably licensed operator.

12.5 Likely Significant Impacts of the Development

12.5.1 Do-Nothing Impact

If the Development were not to go ahead (i.e. in the Do-Nothing scenario) there would be no additional excavation, construction or operational waste generated at this site. There would, therefore, be a neutral effect on the environment in terms of waste.

12.5.2 Construction Phase

If waste materials are not managed and stored correctly, it is likely to lead to litter or pollution issues at the Development site and in adjacent areas. The indirect effect of litter issues is the presence of vermin/fly in areas affected. In the absence of mitigation, the effect on the local and regional environment is likely to be **short-term, not significant** and **negative**.

The use of non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste, resulting in indirect negative environmental impacts, including pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. In the absence of mitigation, the effect on the local and regional environment is likely to be **long-term, not significant** and **negative**.

C&D wastes arising should have been taken to suitably registered / permitted / licenced waste facilities for processing and segregation, reuse, recycling, recovery, and / or disposal, as appropriate. There are numerous licensed waste facilities in the SR and across the island of Ireland which can accept hazardous and non-hazardous waste materials, and acceptance of waste from the Proposed Development site would be in line with daily activities at these facilities. At present, there is sufficient capacity for the acceptance of the likely C&D waste arisings at facilities in the region. The majority of construction materials were either recyclable or recoverable. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **short-term, significant** and **negative**.

There was be soil, stones, clay excavated to facilitate construction of the development and as part of normal quarrying practices. A detailed review of the existing ground conditions on a regional, local and site-specific scale are presented in Chapter 7 (Land, Soils, Geology & Hydrogeology). Correct classification and segregation of the excavated material is required to ensure that any potentially contaminated materials are identified and handled in a way that did not have impact negatively on workers, or on the water and soil environments, both on and off-site. However, in the absence of mitigation, the effect on the local and regional environment is likely to be **short-term, significant** and **negative**.

12.5.3 Operational Phase

The potential impacts on the environment of improper, or a lack of, waste management during the operational phase would be a diversion from the priorities of the waste hierarchy, which would lead to small volumes of waste being sent unnecessarily to landfill and diverted from reuse or recycling. In the absence of mitigation, the effect on the local and regional environment is likely to be **long-term, significant** and **negative**.

The nature of the Development means the generation of waste materials during the operational phase is unavoidable. Networks of waste collection, treatment, recovery and disposal infrastructure are in place in the region to manage waste effectively from this type of development. Waste unsuitable for recycling is typically sent for energy recovery. There are also facilities in the region for segregation of municipal recyclables, which is typically exported as a raw material for the production of recycled products (e.g. paper mills and glass recycling).

If waste material is not managed and stored correctly, it is likely to lead to litter or pollution issues at the development site and in adjacent areas. The knock-on effect of litter issues is the presence of vermin in

affected areas. In the absence of mitigation, the effect on the local and regional environment is likely to be **long-term, significant and negative**.

Waste contractors would have been required to service the Development on a regular basis to remove waste. The use of non-permitted waste contractors or unauthorised facilities could give rise to inappropriate management of waste and result in negative environmental impacts or pollution. It is essential that all waste materials are dealt with in accordance with regional and national legislation, as outlined previously, and that time and resources are dedicated to ensuring efficient waste management practices. In the absence of mitigation, the effect on the local and regional environment is likely to be **indirect, long-term, significant and negative**.

12.6 Mitigation Measures

This section outlines the measures that should have been employed in order to reduce the amount of waste produced, manage the wastes generated responsibly and handle the waste in such a manner as to minimise the effects on the environment.

The concept of the 'circular economy'(CE) and 'waste hierarchy' are employed when considering all mitigation measures.

While the waste hierarchy states that the preferred option for waste management is prevention and minimisation of waste, followed by preparing for reuse and recycling / recovery, energy recovery (i.e. incineration) and, least favoured of all, disposal.

12.6.1 Construction Phase

The following mitigation measures were implemented during the construction phase of the development:

WM_1:

As previously stated, a project-specific RWMP has been prepared in line with the requirements of the EPA 'Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects' (2021) and is included as **Appendix 12.1**. The mitigation measures outlined in the RWMP should have been implemented in full and form part of the mitigation strategy for the site. The mitigation measures presented in this RWMP would normally ensure effective waste management and minimisation, reuse, recycling, recovery and disposal of waste material generated during the excavation and construction phases of the Proposed Development.

- Prior to commencement, the appointed Contractor(s) was required to refine / update the RWMP (**Appendix 12.1**) in agreement with CCC and in compliance with any planning conditions, or submit an addendum to the RWMP to CCC, detailing specific measures to minimise waste generation and resource consumption, and provide details of the proposed waste contractors and destinations of each waste stream.
- The Contractor implemented the RWMP throughout the duration of the excavation and construction phases.

WM_2:

There was soil, stones, clay excavated to facilitate construction of the development and as part of normal quarrying practices. It is envisaged that excavated material was sold as product and where excavated material was not of product standard it was retained and reused onsite for landscaping and fill. If any of

the remaining material was deemed unsuitable for reuse, it was removed offsite. When removal was required, correct classification and segregation of the excavated material was required to ensure that any potentially contaminated materials were identified and handled in a way that did not impact negatively on workers as well as on water and soil environments, both on and off-site.

WM_3:

Building materials were chosen to 'design out waste';

WM_4:

On-site segregation of waste materials was carried out to increase opportunities for off-site reuse, recycling and recovery. The following waste types, at a minimum, were segregated:

- Clean Soil and;
- Contaminated soil (if located onsite)

WM_5:

Left over materials and any suitable construction materials were re-used on-site, where possible; (alternatively, the waste was sorted for recycling, recovery or disposal);

WM_6:

All waste materials were stored in skips or other suitable receptacles in designated areas of the site;

WM_7:

Any hazardous wastes generated (such as chemicals, solvents, glues, fuels, oils) were also segregated and were stored in appropriate receptacles (in suitably bunded areas, where required);

WM_8:

A Resource Manager was appointed by the main Contractor(s) to ensure effective management of waste during the excavation and construction works;

WM_9:

All construction staff were provided with training regarding the waste management procedures;

WM_10:

All waste leaving site was reused, recycled or recovered, where possible, to avoid material designated for disposal;

WM_11:

All waste leaving the site was transported by suitably permitted contractors and taken to suitably registered, permitted or licenced facilities;

WM_12:

All waste leaving the site was recorded and copies of relevant documentation maintained;

WM_13:

Nearby sites requiring clean fill material were contacted to investigate reuse opportunities for clean and inert material, if required. If any of the material is to be reused on another site as by-product (and not as a waste), this was done in accordance with Regulation 27 (By-products), as amended, European Union (Waste Directive) Regulations 2011-2020.

These mitigation measures ensured that the waste that arose from the construction phase of the Development was dealt with in compliance with the provisions of the Waste Management Act 1996, as amended, associated Regulations and the Litter Pollution Act 1997, as amended and the NWMPCE. It did ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved and did promote more sustainable consumption of resources.

12.6.2 Operational Phase

During the facilities operations, waste materials were segregated on-site, where possible, into at least the following non-hazardous waste types:

WM_14:

Waste volumes generated on site were low and primarily consisted of the following waste streams that did derive from either the canteen or the maintenance of on-site mobile plant:

- LoW/EWC 20 01 08 biodegradable kitchen and canteen waste
- LoW/EWC 20 03 01 mixed municipal waste
- LoW/EWC 16 01 07* oil filters
- LoW/EWC 16 01 13* brake fluids
- LoW/EWC 16 01 99 wastes not otherwise specified
- LoW/EWC 13 05 03* interceptor sludges

WM_15:

All waste materials were segregated into appropriate categories and were stored in appropriate bins or other suitable receptacles in a designated, easily accessible areas of the site. Bins were clearly identified with the approved waste type to ensure there is no cross contamination of waste materials.

WM_16:

All wastes generated by the servicing and maintenance of plant was immediately removed from site by the service contractor.

WM_17:

Sludges from the on-site interceptor were removed on a regular basis (at least annually) by a suitably licensed operator.

WM_18:

During the operational phase, personnel monitored waste generation volumes against previous yearly quantities. There may be opportunities to reduce the waste receptacles, collection frequencies and equipment required where estimates have been too conservative. Reductions in equipment/bin requirements were used to reduce waste contractor costs. Waste legislation was also consulted on a regular basis in case of any changes which may have impacts on waste management procedures.

WM_19:

The operator and staff did ensure that all waste leaving the site was transported by suitably permitted contractors and taken to suitably registered, permitted, or licensed facilities.

These mitigation measures did ensure the waste arising from the development is dealt with in compliance with the provisions of the *Waste Management Acts 1996 - 2011* and associated Regulations, the *Litter Pollution Act of 1997* as amended and the *NWMPCE*. It did ensure optimum levels of waste reduction, reuse, recycling and recovery are achieved.

12.7 Residual Impacts

The implementation of the mitigation measures outlined in Section 12.6 ensured that a high rate of reuse, recovery and recycling was achieved at the Development during the excavation and construction phases as well as during the operational phase. It ensured that European, national and regional legislative requirements with regard to waste are met, and that associated policy targets for the management of waste are achieved.

12.7.1 Construction Phase

A carefully planned approach to waste management as set out in Section 12.6 and adherence to the RWMP (which includes mitigation) (Appendix 12.1) during the construction phase did promote resource efficiency and waste minimisation. When the mitigation measures are implemented and a high rate of prevention reuse, recycling and recovery is achieved, the predicted impact of the construction phase on the environment was **short-term, imperceptible and neutral**.

12.7.2 Operational Phase

During the operational phase, a structured approach to waste management as set out in **Section 12.6** and did promote resource efficiency and waste minimisation. When the mitigation measures were implemented and a high rate of reuse, recycling and recovery was achieved, the predicted impact of the operational phase on the environment was **long-term, imperceptible and neutral**.

12.8 Monitoring

The management of waste during the construction phase were monitored by the Contactor's appointed Resource Manager to ensure compliance with the above-listed mitigation measures, and relevant waste management legislation and local authority requirements, including maintenance of waste documentation.

The management of waste during the operational phase was monitored by the Operator / Personnel to ensure effective implementation of the operational mitigation by the nominated waste contractor(s).

Likely Significant Effect	Monitoring Proposals
Litter Pollution (Construction Phase)	The Contractor reviewed and maintained waste records and site audits
Unlicensed Waste Collection (Illegal Dumping) (Construction Phase)	A register was maintained and reviewed. A copy of all waste collection permits was maintained.
Insufficient Waste Facilities	A register was maintained and reviewed. A copy of all waste collection permits was maintained.
Lack of Waste Classification	An appointed Resource Manager did monitor all on-site waste segregation and classification

Unlicensed Waste Collection (Illegal Dumping) (Operational Phase)	The operator/ facilities management company maintained waste receipts on-site for a period of 7 years and made it available to CCC when requested.
Poor Waste Segregation	Waste generation volumes and cross contamination was monitored by the operator / facilities management company
Litter Pollution (Operational Phase)	Waste storage areas were monitored by the operator / facilities management company

Table 12.2: Monitoring Proposals

12.8.1 Construction Phase

The objective of setting targets for waste management is only achieved if the actual waste generation volumes are calculated and compared. This is particularly important during the excavation and construction phases where there is a potential for waste management to become secondary to progress and meeting construction schedule targets.

The management of waste during the construction phase was monitored to ensure compliance with relevant local authority requirements, and effective implementation of the RWMP, including maintenance of waste documentation. The mitigation measures in the RWMP specify the need for a Resource Manager to be appointed who did have responsibility to monitor the actual waste volumes being generated and to ensure that contractors and sub-contractors are segregating waste as required. Where targets are not being met, the Resource Manager shall identify the reasons for targets not being achieved and work to resolve any issues. Recording of waste generation during the construction phase did enable better management of waste contractor requirements and identify trends.

12.8.2 Operational Phase

The management of waste during the operational phase was monitored to ensure effective implementation of mitigation measures by facilities management and the nominated waste contractor(s). There were opportunities to reduce the number of bins and equipment required in the Waste Storage Area where estimates were too conservative. Reductions in bin and equipment requirements did improve efficiency and reduce waste contractor costs.

12.9 Indirect and/or Secondary Impacts

The following **Table 12.3** summarises the identified likely significant effects during the construction phase including site excavations and demolition works of the Development before mitigation measures are applied.

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Litter Pollution	Negative	Significant	Local	Likely	Short-Term	Indirect & Direct
Unlicensed Waste Collection (Illegal Dumping)	Negative	Significant	Local & Regional	Likely	Long-Term	Direct

Insufficient Waste Facilities	Negative	Significant	Local & Regional	Unlikely	Short-Term	Direct
Lack of waste Classification	Negative	Significant	Local & Regional	Likely	Short-Term	Direct

Table 12.3: Summary of Construction Phase Likely Significant Effects in the Absence of Mitigation

The following **Table 12.4** summarises the identified likely significant effects during the operational phase of the Development before mitigation measures are applied.

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Unlicensed Waste Collection (Illegal Dumping)	Negative	Significant	Local & Regional	Likely	Long-Term	Direct
Poor Waste Segregation	Negative	Significant	Local & Regional	Likely	Long-Term	Direct
Litter Pollution	Negative	Significant	Local & Regional	Likely	Long-Term	Direct

Table 12.4: Summary of Operational Phase Likely Significant Effects in the Absence of Mitigation

12.10 Cumulative Impacts

The full list of developments considered in the cumulative impacts section can be found in Appendix 2.1 of the submitted EIAR.

12.10.1 Construction Phase

Other developments in the area were required to manage waste in compliance with national and local legislation, policies and plans which did minimise / mitigate any potential cumulative impacts associated with waste generation and waste management. As such, the cumulative effect in terms of waste were **short-term, imperceptible and neutral**.

12.10.2 Operational Phase

There are/were existing residential and commercial developments including quarries close by, along with the multiple permissions granted and remaining to be decided in the area. Authorised waste contractors were required to collect waste materials segregated, at a minimum, into recyclables, organic waste and non-recyclables.

Other developments in the area were/are required to manage waste in compliance with national and local legislation, policies and plans which did minimise/mitigate any potential cumulative impacts associated with waste generation and waste management. As such the effect was a **long-term, imperceptible and neutral**.

12.11 Interactions

12.11.1 Land, Soils, Geology & Hydrogeology

There were soil, stones, clay excavated to facilitate construction of the development and as part of normal quarrying practices. Excavated material was sold as product and where excavated material was not of product standard it was able to be retained and reused onsite for landscaping and fill. If any of the

remaining material was deemed unsuitable for reuse it, did need to be removed offsite. This material was taken for appropriate offsite reuse, recovery, recycling and / or disposal.

Correct classification and segregation of the excavated material was required to ensure that any potentially contaminated materials were identified and handled in a way that did not impact negatively on workers, or the water and soil environments, both on and off-site. When material had to be taken off-site, it was taken for reuse or recovery, where practical, with disposal a last resort.

Adherence to the mitigation measures in Chapter 7 (Land, Soils, Geology), Chapter 8 (Hydrology & Hydrogeology) and the requirements of the RWMP did ensure the associated effect is ***long-term, imperceptible and neutral***.

12.11.2 Traffic and Transportation

Local traffic and transportation was impacted by the additional vehicle movements generated by removal of waste from the site during the construction and operational phases of the Development. The increase in vehicle movements as a result of waste generated during the construction phase was temporary in duration. There is unlikely to be an increase in vehicle movements in the area as a result of waste collections during the operational phase, however if there was then these movements were imperceptible in the context of the overall traffic and transportation increase and have been addressed in Chapter 13 (Material Assets – Traffic & Transportation).

Provided the mitigation measures detailed in Chapters 12 & 13 and the requirements of the RWMP (included as Appendix 12.1) are adhered to, the associated effect was be ***short to long-term, imperceptible and neutral***.

12.11.2.1 Population & Human Health

The potential impacts on human beings in relation to the generation of waste during the construction and operational phases are that the incorrect management of waste could result in littering, which could cause a nuisance to the public, attract vermin and cause a visual impact. Adherence to the mitigation measures detailed in Chapter 12 and Chapter 5 (Population & Human Health), along with a carefully planned approach to waste management, adherence to the project-specific RWMP (Appendix 12.1) did ensure appropriate management of waste and avoid any negative impacts on the local population. The associated effect was ***long-term, imperceptible and neutral***.

12.11.3 Biodiversity

The potential impacts on biodiversity in relation to the generation of waste during the construction or operational phases are that the incorrect management of waste could result in littering, pollution issues or vermin in areas affected. Provided the mitigation measures detailed in Chapters 12 & 06 (Biodiversity) and the requirements of the RWMP (included as Appendix 12.1) are adhered to, the associated effect was short to ***long-term, imperceptible and neutral***.

12.12 References

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