
Chapter 19
Material Assets:
Resources and Waste
Management

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19. MATERIAL ASSETS: RESOURCES AND WASTE MANAGEMENT

19.1 Introduction

This chapter addresses the potential for impacts on resource use and waste associated with the DART+ West project, hereafter referred to as the 'proposed development'.

The proposed development aims to modernise and improve the existing Maynooth & M3 Parkway lines by providing a sustainable, electrified, reliable and more frequent rail service, improving capacity on rail corridors serving Dublin. It is expected that impacts on resource use and waste will occur primarily during the construction phase of the proposed development. The operational impacts are considered for the first year of operation.

This chapter should be read in conjunction with the following Chapters, and their Appendices, which present related impacts arising from the proposed development and proposed mitigation measures to ameliorate the predicted impacts:

- Chapter 4 Description of the Proposed Development.
- Chapter 5 Construction Strategy.
- Chapter 6 Traffic and Transportation.
- Chapter 9 Land and Soils.
- Chapter 10 Water (including Hydrology & Flood Risk).
- Chapter 25 Interactions.

This chapter sets out the legislation, policy and guidance followed (Section 19.2), the methodology used for the assessment (Section 19.3), the receiving environment (Section 19.4) and sets out the predicted impacts of the proposed development on resource use and waste (Section 19.5). Section 19.6 sets out mitigation measures to avoid / minimise impacts identified, and details of any residual impacts are described in Section 19.7. A list of reference material used to compile this chapter is contained in Section 19.10.

19.2 Legislation, policy and guidance

19.2.1 Legislation

This assessment has been undertaken in accordance inter alia with EU Directive 2011/92/EU as amended by Directive 2014/52/EU on the assessment of the effects of certain public and private projects on the environment ("the EIA Directive"), the Transport Railway Infrastructure Act 2001 (as amended and substituted), the European Union (Railway Orders) (Environmental Impact Assessment) (Amendment) Regulations 2021 (S.I. No. 743/2021) which give further effect to transposition of the EIA Directive by amending the Transport (Railway Infrastructure) Act 2001, the EU Waste Framework Directive (2008/98/EC) (as amended by Commission Regulation (EU) No.1357/2014 of 18 December 2014, Commission Directive (EU) 2015/1127, Council regulation (EU) 2017/997 of 8 June 2017, Directive (EU) 2018/851 of the European Parliament and of the Council, the Waste Management Act 1996 (as amended and substituted), the European Union (Waste Directive) Regulations 2011-2020 including the European Union (Waste Management) (Environmental Impact Assessment) Regulations 2020 (S.I. No. 130/2020), the European Union (Waste Directive) Regulations 2020 (S.I. No.323/2020), the European Communities (Waste Directive) Regulations 2011 (S.I. No. 126 of 2011), the European Communities (Waste Directive) (No. 2) Regulations 2011 (S.I. No. 323/2011), Waste Classification – List of Waste and Determining if Waste is Hazardous or Non- Hazardous (EPA, 2015).

Legislative exemptions

The European Union (Waste Directive) regulations 2011 set out the exclusions from the scope of the Directive which includes the following under Article 3(1)(c):

“uncontaminated soil and other naturally occurring material excavated in the course of construction activities where it is certain that the material will be used for the purposes of construction in its natural state on the site from which it was excavated”

Materials from the proposed development which fall within this provision are therefore not subject to the requirements of EU and National waste legislation.

Article 27 of the European Communities (Waste Directive) Regulations 2011 allows an economic operator to decide, under specific circumstances, that material is a by-product and not a waste. The following conditions must be met in this case:

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

Classification of material as a by-product means that the material is of a type that is not regulated by waste management legislation, and therefore is not required to be managed as per that legislation. For such construction projects, excavated soil and stone can be categorised under this exemption provided the material adheres to the conditions stipulated under Article 27. The economic operator and destination for the material must adhere to all applicable requirements for this exemption to be permitted.

Waste Management Act 1996 (as amended)

Any surplus excavated material will be removed off-site either as a waste or, where appropriate, as a by-product. Where the material is to be reused on another site as a by-product (and not as a waste), this will be done in accordance with Article 27 of the European Communities (Waste Directive) Regulations 2011 and having regard for the upcoming Circular Economy Bill 2021 and any such legislative requirements that may be required at a later date.

If the material is deemed to be a waste, removal and reuse/recycling/recovery/disposal of the material will be 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 will dictate whether a Certificate of Registration (COR), permit or licence is required by the receiving facility.

Further details regarding waste management is included in the Construction Environmental Management Plan (CEMP) (see Appendix A5.1 in Volume 4 of this EIAR) and associated Construction and Demolition Waste Management Plan (CDWMP) (see Appendix E of Appendix A5.1 in Volume 4 of this EIAR) and operational plans of CIÉ after consent is given to the development.

The environmental assessment and subsequent management of material assets and waste has endeavoured to apply the following waste management hierarchy (Figure 19.1) in descending order of preference:

- 1) prevention (no waste produced).
- 2) preparing for re-use.
- 3) recycling.
- 4) other recovery, e.g. energy recovery.

5) disposal.

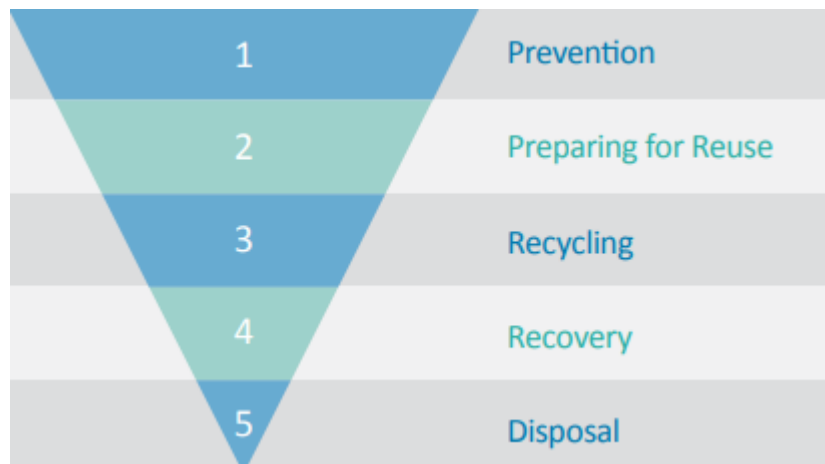


Figure 19-1 The Waste Management Hierarchy as outlined in the Directive 2008/98/EC

19.2.2 Policy

The following EU, national and local policy documents were reviewed:

- EU Construction & Demolition Waste Management Protocol (European Commission 2018).
- Circular Economy Action Plan (European Commission, 2015).
- *Circular Economy Action Plan- For a Cleaner and More Competitive Europe* (European Commission, 2020).
- *A Resource Opportunity – Waste Management Policy in Ireland* (Department of the Environment, Community and Local Government, 2012).
- *Construction & Demolition Waste: Soil and Stone Recovery / Disposal Capacity* (RPS on behalf of Dublin City Council, 2016).
- ‘*Whole of Government Circular Economy Strategy 2022-2023*’ (Department of the Environment, Climate and Communications).
- ‘*A Waste Action Plan for a Circular Economy 2020-2025*’ (Department of Communications, Climate Action and the Environment, 2020).

The proposed development falls within the Eastern-Midland Region (EMR). A Waste Management Plan for the region was published in 2015, ‘*Eastern-Midland Region Waste Management Plan 2015-2021*’. The Plan commits to a large and varied number of waste management policies and objectives for the region. There are several policies and objectives aimed at generally improving waste management in the region, including:

- Policy A.1 which requests the region to ‘*take measures to ensure the best overall outcome by applying the waste management hierarchy to the management of waste streams*’.
- Policy A.3 which sets out the need to ‘*Contribute to the improvement of management performance across all waste streams through implementation of policy actions and monitor progress towards national targets*’.
- Strategic Objective A states that ‘*The region will implement EU and national waste and related environmental policy, legislation, guidance and codes of practice to improve management of material resources and wastes*’.
- Strategic Objective G stipulates that the region is to ‘*Apply the relevant environmental and planning legislation to waste activities in order to protect the environment, in particular European sites, and human health against adverse impacts of waste generated*’.

Circular Economy

Ireland is fully committed to transitioning to a circular economy. To achieve resource efficiency there is a need to move from the traditional linear economy to a circular economy. The Department of Communications,

Climate Action and the Environment's (DCCA) 'A Waste Action Plan for a Circular Economy 2020-2025' (hereafter referred to as the National Waste Action Plan) notes that:

"In a circular economy the value of products and materials is maintained for as long as possible; waste and resource use are minimised, and resources are kept within the economy when a product has reached the end of its life, to be used again and again to create further value"

The overarching objectives of the National Waste Action Plan include:

- *Shift the focus away from waste disposal and treatment to ensure that materials and products remain in productive use for longer thereby preventing waste and supporting reuse through a policy framework that discourages the wasting of resources and rewards circularity.*
- *Make producers who manufacture and sell disposable goods for profit environmentally accountable for the products they place on the market.*
- *Ensure that measures support sustainable economic models (for example by supporting the use of recycled over virgin materials).*
- *Harness the reach and influence of all sectors including the voluntary sector, R&D, producers, manufacturers, regulatory bodies, civic society.*
- *Support clear and robust institutional arrangements for the waste sector, including through a strengthened role for Local Authorities (LAs).*

The proposed project will be located in the Local Authority areas of Dublin City, Fingal, Kildare and Meath. The relevant waste policies/objectives from the county development plans for these local authority areas are summarised below:

Dublin City Development Plan 2016-2022

- Policy SI19: *'To support the principles of good waste management and the implementation of best international practice in relation to waste management in order for Dublin City and the region to become self-reliant in terms of waste management.'*
- Objective SIO17: *'To promote the re-use of building materials, recycling of demolition material and the use of materials from renewable sources. In all developments in excess of 10 housing units and commercial developments in excess of 1000 sq.m, a materials source and management plan showing type of materials/proportion of re-use/recycled materials to be used shall be implemented by the developer.'*
- Objective SIO19: *'To implement the Eastern-Midlands Regional Waste Management Plan 2015-2021 and achieve the plan targets and objectives.'*

Draft Dublin City Development Plan 2022-2028

- Policy CA7(f) sets out that new development should provide for *'minimising the generation of site and construction waste and maximising reuse or recycling'*.
- Policy CA22: *"To support the shift towards the circular economy approach as set out in 'a Waste Action Plan for a Circular Economy 2020 to 2025, Ireland's National Waste Policy, or as updated'."*
- Policy CA23: *"To have regard to existing Best Practice Guidance on Waste Management Plans for Construction and Demolition Projects as well as any future updates to these guidelines to ensure the consistent application of planning requirements"*.
- Policy SI27: *"To support the principles of the circular economy, good waste management and the implementation of best practice in relation to waste management in order for Dublin City and the Region to become self-sufficient in terms of resource and waste management and to provide a waste management infrastructure that supports this objective."*
- Policy SI28: *"To prevent and minimise waste generation and disposal, and to prioritise prevention, recycling, preparation for reuse and recovery in order to safeguard against environmental pollution"*.
- Objective SIO16: *"To support the implementation of the Eastern-Midlands Regional Waste Management Plan 2015-2021 and any subsequent plans in order to facilitate the transition from a waste management economy towards a circular economy"*.

- Objective SI33: *“That all potentially contaminated sites shall be remediated to internationally accepted standards prior to redevelopment. Any unearthed contaminants will require a licence from the Environmental Protection Agency (EPA)”.*

Fingal Development Plan 2017 – 2023

- Objective WM03: *‘Implement the provisions of the Eastern-Midlands Region Waste Management Plan 2015-2021 or any subsequent Waste Management Plan applicable within the lifetime of the Development Plan. All prospective developments in the County will be expected to take account of the provisions of the Regional Waste Management Plan and adhere to the requirements of that Plan’.*
- Objective WM18: *‘Ensure that construction and demolition Waste Management Plans meet the relevant recycling / recovery targets for such waste in accordance with the national legislation and regional waste management policy’*

Draft Fingal Development Plan 2023-2029

- Policy CAP10 (f): *“Minimising the generation of site and construction waste and maximizing reuse or recycling”.*
- Policy CAP10(g): *“The use of construction materials that have low to zero embodied energy and CO2 emissions”.*
- Policy CAP24: *“Support the shift towards the circular economy approach as set out in the National Waste Policy for 2020-2025”.*
- Policy CAP25: *“Have regard to existing Best Practice Guidance on Waste Management Plans for Construction and Demolition Projects as well as any future updates to these Guidelines in order to ensure the consistent application of planning requirements”.*
- Policy IUP20: *“Supporting the implementation of existing waste management policy and promote education and awareness on all issues associated with waste management, both at industry and community level, including the promotion of waste reduction by encouraging reuse, recycling and recovery waste. Fingal County Council will continue to promote and support the objectives of the Eastern-Midlands Region Waste Management Plan 2015-2021, or such plans as may be updated.*
- Policy IUP21: *“Have regard to European Union, National and Regional waste and related environmental policy, legislation, guidance and codes of practice to improve management of material resources and wastes”.*
- Policy IUP22: *“Support the principles of transition from a waste economy towards a green circular economy and implement good waste management and best practices to enable Fingal to become self sufficient in terms of resource and waste management and to enhance employment and increase the value recovery and recirculation of resources”.*
- Objective IUO28: *“Implement the provisions of the Eastern-Midlands Region Waste Management Plan 2015-2021 or any subsequent Waste Management Plan applicable within the lifetime of the Development Plan. All prospective developments in the County will be expected to take account of the provisions of the Regional Waste Management Plan and adhere to the requirement so of that Plan”.*
- Objective IUO29: *“Provide for, promote and facilitate high quality sustainable waste recovery and disposal infrastructure/technology in keeping with the EU waste hierarchy, national legislation and regional waste management policy to adequately cater for Fingal’s growing population”.*
- Objective IUO30: *“Adhere to the recommendations of the National Hazardous Waste Management Plan 2014-2020 and any subsequent plan, and to co-operate with the EPA and other agencies in the planning, organisation and supervision of the disposal of hazardous waste streams, including hazardous waste identified during construction and demolition projects. To continue to promote the use of clean technology and minimization of hazardous waste production in all development within the County”.*
- Policy IUP24: *“Promote and encourage the establishment of re-use, recycling and repair activities to prevent and minimize waste generation and disposal, in accordance with the Eastern-Midlands Region Waste Management Plan 2015-2021 (or any subsequent plan).”*

Kildare County Development Plan 2017 – 2023

- Objective WM3: *Support the implementation of the Eastern-Midlands Region Waste Management Plan 2015-2021 by adhering to overarching performance targets, policies and policy action.*

Draft Kildare Development Plan 2023-2029

- Objective IN O36: “Encourage a just transition from a waste economy to a green circular economy in accordance with a ‘A Waste Action Plan for a Circular Economy 2020-2025”.
- Objective IN O41: “Encourage waste prevention, minimisation, re-use, recycling, and recovery as methods for managing waste”.
- Objective IN O43: “Ensure the provision of waste management facilities in the county (both public and private) are subject to the specific requirements of the Eastern-Midlands Region Waste Management Plan 2015-2021 (or as amended/updated)”.
- Objective IN O45: “Facilitate the development of waste management infrastructure and the ongoing operation of the Drehid waste facility at an appropriate scale to cater for the waste management needs of Kildare and the Eastern and Midlands Waste Region, subject to the protection of the environment, landscape character, road network and amenities of the area”.

Meath County Development Plan 2021 – 2027

- INF Pol 65: *To adopt the provisions of the waste management hierarchy and implement policy in relation to the County’s requirements under the current or any subsequent Waste Management Plan. All prospective developments in the County shall take account of the provisions of the regional waste management plan and adhere to the requirements of the Plan. Account shall also be taken of the proximity principle and the inter-regional movement of waste.*

19.2.3 Guidance

This chapter has been prepared having regard to relevant guidance including, but not limited to:

- *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA May 2022).
- *Guidelines for the Management of Waste from National Road Construction Projects Revision 1* (TII 2014).
- *Guidance on Soil and Stone By-products in the context of Article 27 of the European Communities (Waste Directive) Regulations 2011* (EPA 2019).
- *Guidance on waste acceptance criteria at authorised soil recovery facilities* (EPA, 2020).
- *Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Waste Projects* (Department of Environment Heritage and Local Government, 2006).
- *Best Practice Guidelines for the Preparation of Resource Management Plans for Construction & Demolition Projects* (EPA, 2021).
- *Design Manual for Roads and Bridges (DMRB) (UK) LA110 Material assets and waste* (Highways England, Transport Scotland, Welsh Government & Department for Infrastructure NI, August 2019).
- *EU Construction & Demolition Waste Management Protocol* (European Commission, 2016) (non binding guidelines).
- *Green public procurement- Guidance for the Public Sector* (EPA, 2021).
- *National Hazardous Waste Management Plan 2021-2027 (Draft)* (EPA 2021).

19.3 Methodology

19.3.1 Study area

In accordance with the DMRB Guidance LA110 for Material assets and waste, this assessment includes two study areas.

The first study area is based on the construction footprint/project boundary (including compounds and temporary land take). This study area includes the associated storage areas and construction compound sites.

The second study area includes the planning authorities within the extents of the proposed development namely Dublin City, Fingal, Kildare and Meath. In terms of waste management, all four of these local authorities fall under the Eastern-Midlands Region waste management region. The second study area includes the location of feasible sources, and availability of construction materials required to construct the main elements of the proposed development. As well as suitable recovery and waste management infrastructure (that are licensed for the associated waste type) that could accept arisings and or waste generated by the proposed development. A balance of the proximity principle and value for money is applied.

19.3.2 Desktop study

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.
- A review of the 'Essential Aggregates: Providing for Ireland's needs to 2040' report (Irish Concrete Federation 2018) has been carried out to ascertain the national and regional availability of construction aggregates. For the purposes of this assessment primary aggregates have been chosen to act as a proxy indicator for materials given that large quantities of aggregates are typically required for infrastructure projects of a similar nature, e.g. for direct use in unbound bulk fill and sub-base, and for indirect use in bound applications such as concrete.
- A review of existing and proposed waste management facilities was completed in the vicinity of the proposed development.
- Description of the typical waste materials/arising that will be generated during the site-clearance/ demolition, construction, and operational phases.
- Identification of design solutions and/ or mitigation measure to prevent waste generation and promote management of waste across the proposed development was undertaken in accordance with the waste management hierarchy.

Estimates of waste generation during the demolition, construction and operational phases of the proposed development have been calculated by the design team based on the current design information. Similarly, estimates of resource use in terms of reusability and other materials required, have been calculated by the design team and have been used to inform this assessment.

19.3.3 Assessment methodology

The assessment of the potential impacts of the proposed development arising from the consumption of resources and the generation of waste materials follows the DMRB Guidance LA110 for Material Assets (Resource Use) and waste. The significance category descriptions and significance criteria are set out in Table 19-1 and Table 19-2.

Table 19-1 Resource use and waste significance criteria

Significance Category	Descriptions
Very Large	<p>Material assets:</p> <p>1) no criteria: use criteria for large categories.</p> <p>Waste:</p> <p>1) >1% reduction or alteration in national capacity of landfill, as a result of accommodating waste from a project; or</p> <p>2) construction of new (permanent) waste infrastructure is required to accommodate waste from a project.</p>
Large	<p>Material assets</p> <p>1) project achieves <70% overall material recovery / recycling (by weight) of non-hazardous Construction and Demolition Waste (CDW) to substitute use of primary materials; and</p> <p>2) aggregates required to be imported to site comprise <1% re-used /recycled content; and</p> <p>3) project sterilises ≥1 mineral safeguarding site and/or peat resource.</p> <p>Waste</p> <p>1) >1% reduction in the regional capacity of landfill as a result of accommodating waste from a project; and</p> <p>2) >50% of project waste for disposal outside of the region.</p>
Moderate	<p>Material assets:</p> <p>1) project achieves less than 70% overall material recovery / recycling (by weight) of non-hazardous CDW to substitute use of primary materials; and</p> <p>2) aggregates required to be imported to site comprise re-used/recycled content below the relevant regional percentage target.</p> <p>Waste:</p> <p>1) >1% reduction or alteration in the regional capacity of landfill as a result of accommodating waste from a project; and</p> <p>2) 1-50% of project waste for disposal outside of the region.</p>
Slight	<p>Material assets:</p> <p>1) project achieves 70-99% overall material recovery / recycling (by weight) of non-hazardous CDW to substitute use of primary materials;</p> <p>and</p> <p>2) aggregates required to be imported to site comprise re-used/recycled content in line with the relevant regional percentage target.</p> <p>Waste</p> <p>1) ≤1% reduction or alteration in the regional capacity of landfill; and</p> <p>2) waste infrastructure has sufficient capacity to accommodate waste from a project, without compromising integrity of the receiving infrastructure (design life or capacity) within the region.</p>
Neutral	<p>Material assets:</p> <p>1) project achieves >99% overall material recovery / recycling (by weight) of non-hazardous Construction Demolition Waste (CDW) to substitute use of primary materials; and</p> <p>2) aggregates required to be imported to site comprise >99% re-used /recycled content.</p> <p>Waste</p> <p>1) no reduction or alteration in the capacity of waste infrastructure within the region.</p>

Table 19-2 Significance criteria

Significance	Description
Significant (one or more criteria met)	<p>Material assets:</p> <p>1) category description is met for moderate or large effect.</p> <p>Waste:</p> <p>1) category description is met for moderate, large or very large effect.</p>

Significance	Description
Not significant	<p>Material assets:</p> <p>1) category description is met for neutral or slight effect.</p> <p>Waste:</p> <p>1) category description is met for neutral or slight effect.</p>

19.3.4 Consultation

Consultation with the design team throughout the process has been a key factor that has informed this assessment.

Chapter 3 of this EIAR details the alternatives considered and the consultation undertaken throughout the project. The key consultation phases and the feedback received that has informed this chapter include:

- Non-statutory EIA Scoping Report.
- Options Selection process.
 - Non-statutory public consultation no.1 emerging preferred option (Autumn 2020).
 - Non-statutory public consultation no.2 preferred option (Summer 2021) & Localised Ashtown public consultation on the revised preferred option (Spring 2022).

19.3.5 Difficulties encountered/Limitations

There were no particular difficulties in compiling this chapter. It should be noted that the material estimates provide an estimate of the main materials likely to be required during the construction of the proposed development.

Changes to permitted waste management facilities and capacities of waste facilities are likely throughout the course of the proposed development however through waste management planning, policy, strategic and legislative drivers it will ensure that sufficient capacity continues to be provided.

19.4 Receiving environment

The proposed development will consist of the electrification of the existing Great Southern and Western Railway (GWSR) and the Midland Great Western Railways (MGWR) rail lines from Dublin City centre extending west of Maynooth town as far as the proposed depot and M3 Parkway Station. There is generally a low level of intervention required, except for the proposed Spencer Dock station, the new depot and at the level crossing replacements. The total length of the proposed development is approximately 40 kilometres.

The proposed development begins in the Docklands area which is historically an industrial area where some soil deposits have been contaminated from historic uses (Zones A and B- refer to Chapter 9 Land and Soils in Volume 2 of this EIAR for more details on contaminated soils). For most of its length, the MGWR runs adjacent to the Royal Canal. The route travels through Dublin's northern inner city extending westwards through the Fingal County Council administrative area and on to Meath and Kildare.

A desk-based assessment has been undertaken in order to establish, for the first and second study areas, the current and likely future conditions in the absence of the proposed development for materials and waste. Baseline data has been collected at national and regional level, including: availability of construction aggregates; construction, demolition and excavation waste arisings; as well as information on regional and national waste transfer and treatment and disposal facilities capacity.

19.4.1 Material assets: Resource use

In 2018, the Irish Concrete Foundation published the ‘Essential aggregates: Providing for Ireland’s needs to 2040’ report in response to Government’s Project Ireland 2040 to highlight the strategic importance of aggregates. The report details that Ireland has abundant natural reserves of high-quality aggregates (stone, sand and gravel). The Irish quarrying industry comprises approximately 500 large commercial quarries. These quarries produce aggregates from crushed rock, sand and gravel which are used as key building materials. Aggregates are also the basic raw materials for concrete products which are ubiquitous in Ireland’s built environment. Furthermore, the report indicates that there are approximately 220 ready mixed concrete plants located throughout Ireland.

Table 19-3 below provides quantity information on the total aggregates production in Ireland between 2013-2018.

Table 19-3 Total Aggregates Production in Ireland 2013-2018

Year	2013	2014	2015	2016	2017	2018
	Tonnes					
Aggregates	25,000,000	26,000,000	28,000,000	33,000,000	32,000,000	36,000,000

Table 19-4 below provides quantity information on the total ready mixed concrete in Ireland between 2013 and 2018.

Table 19-4 Total ready mixed concrete in Ireland 2013-2018

Year	2013	2014	2015	2016	2017	2018
	m ³					
Ready mixed concrete	2,400,000	3,000,000	3,500,000	4,100,000	4,500,000	4,900,000

The Contractor(s) will be responsible for sourcing materials for the construction of the proposed development that will comply with specific quality requirements, and where possible, it will seek to use local suppliers and to re-use materials on site to minimise the attendant environmental impact, cost of transport and support the local economy and local communities in line with the proximity principle.

19.4.2 Construction and demolition waste

The baseline target within the UK DMRB (2019) LA110 Material Assets and Waste Guideline for Recovery of Construction and Demolition (C&D) waste is 70% by weight, as set out in the EU Waste Framework Directive. Uncontaminated soil and stones (European Waste Code 17 05 04) are specifically excluded from this target as these can be re-used.

The National Waste Statistics Summary Report published by the EPA in December 2021 indicates that Ireland’s current progress against this C&D waste target is at 84%. Furthermore, according to the report (covering 2019, the latest reference year):

- The quantity of C&D waste generated in Ireland was 8.8 million tonnes, representing an increase of 2.6 million tonnes in 2018.
- In 2019 soil and stone waste accounted for 85%% of total C&D waste. Followed by concrete, brick, tile and gypsum waste accounting for 7% and mixed C&D waste (5%). Only 2.5% of C&D waste was collected separately as single waste streams (wood, glass, plastic or metal).
- 82.4% was recovered through backfilling (due to the high proportion of soil and stone), 6.8% was recycled and 10.4% was disposed of.

The waste generated from the proposed development will have regard to the requirements as set out in the Eastern-Midlands Region (EMR) Waste Management Plan 2015-2021. The proposed development will be generating waste over four county councils, Dublin City Council, Fingal, Kildare and Meath County Councils.

The Regional Plan sets out the strategic targets for waste management in the region and sets a specific target for C&D waste of “70% preparing for reuse, recycling and other recovery of construction and demolition waste” (excluding natural soils and stones and hazardous wastes) to be achieved by 2020. The Waste Action Plan for a Circular Economy continues with this target of keeping the reuse, recycling and other recovery of construction and demolition waste at or above 70%.

Within the EMR, the majority of C&D waste is composed of soil and stone with approximately 77% of the C&D waste in the region falling into this category in 2014 as per the Construction and Demolition Waste – Soil and Stone Recovery/Disposal Capacity – updated report 2020 (RPS on behalf of DCC 2020). The remaining C&D waste in the region comprised other materials such as contaminated soil, rubble, metals, timber, plastic, glass and wood. In terms of the proposed development, majority of the spoil arising from construction and demolition will consist of soil and stone. Due to the track lowering interventions, ballast will also be arising from the works. Additionally, demolition material will be generated as minor demolition is required as part of the enabling works.

There are a number of waste permitted and licensed facilities located in the Eastern-Midlands 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, hazardous waste treatment facilities, municipal waste landfills, material recovery facilities, waste transfer stations and two waste-to-energy facilities.

Within the EMR, 15 soil recovery facilities, operating under Waste Licence with backfilling capacity, were determined to be either active or within the application process at the end of 2018. Soil recovery facilities are generally worked out quarries which are being restored using uncontaminated soil to return natural ground levels.

The total annual capacity for the region at that time (2018) was 2,411,400 tonnes (RPS on behalf of DCC 2020). Licensed capacity is most prominent in the EMR which has a healthy supply of active capacity and substantial new capacity due to come on stream with three facilities in the GDA at application stage. The Region contains 80% of the active national capacity.

The expected year of closure and the remaining capacity of the soil recovery licensed facilities in the counties surrounding the proposed development are summarised in Table 19-5. The capacities provided are the total capacities. It should be noted that the future potential proportion of that capacity available for the proposed development will be less, considering other potential construction projects and other waste streams including municipal waste.

Table 19-5 Soil recovery licensed facilities in counties surrounding the proposed development (Source: RPS and /or EPA Licence Search Website, March 2022)

Facility name	Licence Number & facility type	Status	Authorised annual soil intake (tonnes)	Remaining capacity (Tonnes)	Year of expected closure
County Dublin					
Huntstown Inert Clay Facility (Roadstone)	W0277-03	Active	1,500,000 (soil & stones and dredging spoil 17 05 04 and 20 02 02)	2,555,600	2051
Milverton Waste Recovery (Roadstone)	W0272-01	Active	400,000 (inert soils and stones – 17 05 04 and 20 02 02)	1,886,795	2025

Facility name	Licence Number & facility type	Status	Authorised annual soil intake (tonnes)	Remaining capacity (Tonnes)	Year of expected closure
County Meath					
Clashford Recovery	W0265-01	Authorised (September 2019). Not yet commenced	170,000 (inert soils, stones and dredging material – 17 05 04 and 17 05 06)	805,200	Unknown
Tullykane - Kilsaran Concrete, Kilmessan	W0296-01 Materials Recovery	Authorised (January 2019) Not yet commenced	400,000 (inert soils and stones – 17 05 04)	5,600,000	2033
Mullaghcrone Quarry	W0278-01	Authorised (April 2017) Not yet commenced	100,000 (inert soils, stones and dredging material – 17 05 04 and 17 05 06)	1,800,000	Unknown
Kiernan Sand & Gravel	W0262-01	Active	167,400 (inert soils, stones and dredging material – 17 05 04 and 17 05 06)	938,100	2027
County Kildare					
N&C Enterprises Ltd.	W0292-01	Authorised (August 2017)	345,000 (inert soils and stones 17 05 04)	1,500,000	2031
Kildare Sand & Gravel Ltd	W0295-01	Active	225,000 (inert soils and stones 17 05 04)	1,500,000	Unknown – approx. 8-10 years from commencement
County Wicklow					
Calary Quarry (Roadstone Ltd)	W0293-01	Authorised Not yet commenced	300,000 (inert soils, stones and dredging material – 17 05 04 and 17 05 06)	3,280,000	2040
Potential total annual licensed soil / C&D waste capacity in the counties surrounding the proposed development			Circa. 3,608,167 tonnes		
Predicted potential remaining licensed soil recovery capacity in the counties surrounding the proposed development				Circa, 19,865,516	

Waste transfer stations are facilities that accept C&D waste. Table 19-6 summarises the transfer stations which are currently operational in the counties surrounding the proposed development. Waste transfer stations are facilities whereby wastes can be temporarily deposited and therefore reducing the cost and traffic impact by facilitating the bulk haulage of the waste in larger vehicles to the final destination.

Table 19-6 Licensed waste transfer stations and their permitted C&D intake per annum ((Source: EPA Licence Search Website, March 2022))

County	Facility	Licence Number	Annual Intake (tonnes)
Co. Dublin	Strarrus Eco. Holdings Ltd.	W0039-02	150,000 (total including all waste types)
	Paidraig Thornton Waste Disposal Ltd.	W0044-02	30,000 (maximum C&D waste per annum)
	Starrus Eco Holdings Ltd	W0183-01 (W183-02 in application)	24,000-30,000 (maximum C&D waste per annum)
	Rilta Environmental Ltd.	W0192-03	500 (maximum non-hazardous C&D waste per annum)

County	Facility	Licence Number	Annual Intake (tonnes)
			68,000 (maximum hazardous C&D waste per annum)
	Oxigen Environmental	W0152-01	10,200 (maximum C&D waste per annum)
	Advanced Environmental Solutions Ltd.	W0222-01	29,000 (maximum C&D waste per annum)
	Paidraig Thornton Waste Disposal Ltd.	W0277-01	20,000 (maximum C&D waste per annum)
	Irish Packaging Recycling Ltd.	W0263-01	50,000 (maximum C&D waste per annum)
	Dean Waste company (Upper Sheriff Street)	W0042-01	45,000 (Commercial and Industrial non-hazardous solids) 105,000 (C&D waste)
	Green Circular Economy Unlimited Company	W0095-01	14,000 (Commercial and Industrial) 3000 (Construction and demolition)
Co. Meath	Advanced Environmental Solutions Ltd.	W0131-02	23,750 (maximum C&D waste per annum)
	Mulleadys Ltd.	W0197-02	8,000 (maximum C&D waste per annum)

There a number of facilities in the counties surrounding the proposed development which hold a Waste Facility Permit or Certificate of Registration from the applicable local authorities. These facilities accept soils and inert waste from construction and demolition activities. Furthermore, these facilities are all permitted or certified to operate Class 5 (recovery of excavation or dredge spoil), Class 6 (recovery of inert waste (other than excavations or dredging comprising natural materials), and/or Class 7 (recovery of inert waste arising from construction and demolition activity) as described in the Third Schedule of the Waste Management (Facility Permit and Registration) Regulations 2007 (S.I. No. 821/2007). In the instance of Certificates of Registration, the maximum allowable quantities vary as follows; Class 5- the total quantity of waste recovered at the facility shall not exceed 25,000 tonnes; Class 6- total waste recovered to not exceed 10,000 tonnes; and Class 7- the annual intake limit is 10,000 tonnes. Table 19-7 provides a non-exhaustive list of the existing waste facility permit and certificate of registration holders in the counties in and around the proposed development. It should be noted that the capacity is a total figure for the facility inclusive of all waste types accepted and not just C&D waste.

Table 19-7 Existing Waste facility permit and certificate of registration holders in the Counties in and around the proposed development location (Source: NWCPO website search March 2022)

Holder of Permit/Certificate	WFP or CoR Number	Class of activity	Authorised capacity (tonnes)	Expiration
Dublin City Council				
Hegarty Demolition Ltd.	WFP-DC-17-0038-01	Class 7	49,999 per annum C&D waste	22/11/2022
John J Duffy Construction Ltd.	WFP-DC-17-0041-01	Class 7	49,999 per annum C&D waste	10/01/2023
Tony Kirwan Civil Engineering Ltd.	WFP-DC-17-0042-01	Class 7	49,999 per annum C&D waste	10/01/2023
Barnmore Demolition & Civil Engineering Ltd.	WFP-DC-17-0043-01	Class 7	49,999 per annum C&D waste	29/01/2023
Breffni Building & Civil Engineering Ltd.	WFP-DC-18-0046-01	Class 7	49,999 per annum C&D waste	11/04/2023
J Ryan Haulage Ltd	WFP-DC-18-0045-01	Class 7	49,999 per annum C&D waste	07/06/2023
Everyday Waste and Skip Hire Ltd.	WFP-DC-10-0020-02	Class 7	16,300 per annum C&D waste	29/09/2023

Holder of Permit/Certificate	WFP or CoR Number	Class of activity	Authorised capacity (tonnes)	Expiration
John Tinelly & Sons Ltd	WFP-DC-17-0037-01	Class 7	49,999 per annum C&D waste	18/06/2022
McManus Crushing Ltd - Mobile Crusher	WFP-DC-19-0049-01	Class 7	49,999 per annum C&D waste	24/08/2024
L&M Keating Ltd.	WFP-DC-18-0047-01	Class 7	49,999 per annum C&D waste	17/06/2024
O'Kelly Brothers Civil Engineering Co Ltd	WFP-DC-19-0050-01	Class 7	49,999 per annum C&D waste	09/03/2025
Shanowen Plant Hire Ltd	WFP-DC-20-0054-01	Class 7	49,999 per annum C&D waste	23/02/2025
Loftus Demolition & Recycling Ltd.	WFP-DC-20-0053-01	Class 7	49,999 per annum C&D waste	18/08/2025
Fingal County Council				
Rudder Transport Ltd.	COR-FG-17-0001-01	Class 5	24,943 total	24/04/2023
M50 Skip Hire and Recycling Ltd	WFP-FG-15-0001-03	Class 7	49,999 per annum C&D waste	06/09/2023
Glv Bay Lane Ltd	WFP-FG-19-0003-01	Class 7	49,999 per annum C&D waste	12/03/2025
Meath County Council				
Martin Brady	WFP-MH-10-0008-03	Class 5	15,000 total	19/07/2022
Tarstone Road Maintenance Ltd.	COR-MH-17-0002-01	Class 7	10,000 per annum	12/06/2022
Christopher Rafter	WFP-MH-17-0006-01	Class 5	99,340 total	26/07/2022
Patrick Carberry	WFP-MH-17-0003-01	Class 5	81,000 total	16/02/2022
Christopher McHugh	WFP-MH-18-0001-01	Class 5	25,000 per annum	07/02/2023
Thomas Curtis	WFP-MH-18-0005-01	Class 5	79,485 total	21/08/2023
Ronan Sheridan Plant Hire Ltd.	WFP-MH-18-0002-01	Class 5	91,620 total	12/09/2023
Ronan Sheridan Plant Hire Ltd.	WFP-MH-18-0006-01	Class 5	83,982 total	24/09/2023
Rudder Transport Ltd.	WFP-MH-18-0007-01	Class 5	98,043 total	04/10/2023
GF Farrelly Haulage Ltd.	COR-MH-18-0003-01	Class 5	24,097 total	20/09/2023
Enda O'Rafferty	WFP-MH-19-0001-01	Class 5	90,000 total	22/01/2024
Rossmore Civils Limited	WFP/MH/19/0009/01	Class 5	200,000 total	10/03/2025
Timberun Trading Limited	WFP-MH-19-0010-01	Class 5	200,000 total	18/05/2025
Eoin Smith Ltd	WFP-MH-20-0007-01	Class 5	200,000 total	02/04/2025
Kildare County Council				
Martin Coyne & Adele Clinton	COR-KE-17-0027-01	Class 5	13,500 total	22/06/2022
Wilton Scrap Metals Ltd.	WFP-KE-18-0091-01	Class 7	21,000 per annum	16/05/2023
Merlon Contractors Ltd.	COR-KE-18-0030-01	Class 5	25,000 total	03/05/2023
Ballymore Naas Developments Ltd.	COR-KE-19-0032-01	Class 5	25,000 total	26/02/2024
Arkill Ltd.	WFP-KE-18-0087-01	Class 5 & 7	100,000 total	04/02/2023
Oliver Richardson	WFP-KE-18-0090-01	Class 5	100,000 total	05/04/2023
Tommy & Dawn Lynch	COR-KE-19-0033-01	Class 5	25,000 total	06/08/2024

Holder of Permit/Certificate	WFP or CoR Number	Class of activity	Authorised capacity (tonnes)	Expiration
Robert Wilson Wright	WFP-KE-20-0098-01	Class 5 & 7	100,000 total and 50,000 per annum	03/02/2025
Shannon Valley Plant Hire Unlimited Company	WFP-KE-20-0099-01	Class 5	200,000 total	19/05/2025
Nickolas Walsh	WFP-KE-20-0104-01	Class 5	200,000 total	01/10/2025
J Ryan Haulage Ltd	WFP-KE-20-0101-01	Class 5	200,000 total	26/07/2025
J Ryan Haulage Ltd	WFP-KE-20-0103-01	Class 5	200,000 total	30/09/2025
Robertstown GFC	COR-KE-20-0036-01	Class 5	25,000 total	28/10/2025
South Dublin County Council				
RDC Civil Engineering Limited	COR-DS-17-0001-01	Class 7	10,000 per annum C&D waste	25/04/2022
Wicklow County Council				
TP&S Delahunt	WFP-WW-16-0038-01	Class 5	50,000 total	22/01/2022
Bolagh Sand & Gravel	WFP-WW-17-0039-01	Class 7	25,000 per annum C&D waste	15/05/2022
Marrakesh Ltd	WFP-WW-18-0041-01	Class 5	42,200 total	31/08/2022
Cullen Excavations Ltd.	WFP-WW-17-0003-04	Class 7	50,000 total	19/06/2023
Dempsey Sand & Gravel Ltd.	WFP-WW-19-0052-01	Class 5	67,500 total	19/06/2023
Ger Devlin Haulage & Plant Hire Ltd	COR-WW-20-0033-01	Class 5	25,000 total	07/01/2023

The remaining capacity and the expected year of closure of the active licensed landfill facilities in the counties surrounding the proposed development are summarised in Table 19-8.

Table 19-8 Landfill licensed capacities in Counties surrounding the proposed development (Source: EPA licence search website March 2022 and RPS 2020)

Facility name	Licence number and facility type	Annual authorised intake (Tonnes) per annum	Remaining capacity (Tonnes)	Expected year of closure
County Dublin				
Integrated Materials Solutions Ltd Partnership, Hollywood Great, Nags Head, The Naul, Dublin	W0129-02 Inert Landfill	500,000 (inert construction and demolition waste and inert dredging spoils)	3,874,316 (RPS, 2020)	2028
Huntstown Inert Clay Facility (Roadstone)	W0277-03	1,500,000 (soil & stones and dredging spoil)	2,555,600 (RPS, 2020)	2051
County Kildare				
Drehid Waste Management Facility (Bord na Mona), Killinagh Upper, Naas, Kildare	W0201-03 (W021-04 in application) Landfill	120,000 (total for landfilling). Application for increase of 250,000 (non-hazardous material for landfill)	1,145,000 approx. (636,085m ³ void space reported, tonnes worked out at 1.8 t/m ³) (application for increase in non-hazardous capacity to 6,250,000 and addition of hazardous capacity of 2,125,000) (Drehid Planning Website accessed 21 November 2021)	2028

Facility name	Licence number and facility type	Annual authorised intake (Tonnes) per annum	Remaining capacity (Tonnes)	Expected year of closure
Walshestown Restoration Ltd, Walshestown, Blackhall, Tipperkevin and Bawnoge, Naas, Kildare	W0254-01 Inert landfill	330,000 (total including soils and stones and other waste)	2,105,239	2026 / 2027
County Meath				
Knockharley Landfill	W0146-02 (W0146-04 in application) Landfill	25,000 (C&D for recovery) 70,000 (inert waste for recovery)	2,300,000 approx	2021
County Wicklow				
Ballynagran Residual Landfill (Greenstar Holdings Ltd)	W0165-02 Landfill	28,000 (C&D waste)	2,200,000 (based on 1,900,000 m ³)	2026
Potential total annual licensed soil/C&D waste capacity		Approx. 2,500,000 (excluding the additional tonnage applied for)		
Estimated potential remaining licensed soil/C&D waste capacity			Approximately 14,000,000 – (approx. equivalent to 7,900,000m³)	

The facilities listed in Table 19-13 and Table 19-8 are indicative of the types of facilities available to take waste likely to be generated during the construction phase of the proposed development. The final destinations cannot be determined at this stage of the proposed development as it is dependent on the contractor and will be informed by up-to-date information on the available facilities and their capacities when the project is at the construction phase. However, the review above shows that there is sufficient capacity in the region to handle the various waste streams.

19.4.3 Hazardous waste

The EPA¹ has reported that in 2020, approximately 65% of the 557,221 tonnes for hazardous waste generated was from industry, 32% was from the construction sector and 3% was from municipal sources such as households, small businesses, educational facilities etc.

There has also been an increase in the treatment of hazardous waste in Ireland, however the majority of Ireland's hazardous waste was still exported to other EU member states for treatment in 2020, amounting to 304, 845 tonnes. Irish hazardous waste treatment facilities treated 103, 931 tonnes of hazardous waste to non-hazardous status in 2020. The waste types treated included motor oil, healthcare wastes, sludges, filter cakes, absorbents, laboratory and chemical waste and household hazardous waste from civic amenity sites. This waste is treated until it is non-hazardous; the non-hazardous wastes that result are then further treated either in Ireland or abroad.

Within Ireland, there are two facilities that are able to accept asbestos wastes. Details of these sites are provided in Table 19-9.

¹ [Hazardous | Environmental Protection Agency \(epa.ie\)](https://www.epa.ie/)

Table 19-9 Existing Waste Facility Permit able to accept Asbestos in Ireland (Source: EPA website March 2022)

Facility Name	Licence Number & Facility Type	Status	Annual Authorised Intake (Tonnes)	Source of Information
Veolia Environmental Services Technical Solutions Limited	W0050-02	Licensed	3,000 tonnes of hazardous C&D waste	EPA Website
Rilta Environmental Limited	W0192-03	Licensed	8,100 tonnes per annum of specifically C&D materials containing asbestos 17 06 01* & 17 06 05*	EPA Website

According to the EPA, in 2020 the total amount of contaminated soil generated in Ireland was just over 90,000 tonnes with approximately 44,000 tonnes of the contaminated soil being exported for treatment. Majority of the exported contaminated soil went to Norway (42,146 tonnes). Almost 6,000 tonnes of contaminated soil was treated at Irish waste facilities in 2020.

19.5 Description of potential impacts

The following section is the evaluation of the likely impacts as a result of the anticipated materials consumption and waste generation during the construction phase of the proposed development without any mitigation measures. This chapter should be read in conjunction with Chapter 5 (Construction Strategy) Chapter 6 (Traffic and Transportation), Chapter 12 (Air Quality) and Chapter 13 (Climate) for information on the impacts associated with the transportation of materials and waste as part of the construction phase of the proposed development.

19.5.1 Do Nothing Scenario

Under the Do-Nothing Scenario, the proposed development does not go ahead and the associated use of natural and man-made construction materials and associated waste arisings does not occur therefore reducing the demand on natural resources and waste facilities.

During the operational phase, the existing diesel-powered trains would remain on the railway line and the necessary capacity enhancements would not be achieved. As the fleet reaches obsolescence it would result in increased maintenance and resource use due to the requirement for more frequent maintenance resources and increasing fuel use which could result in impact to service users and costs due to rising fuel prices.

19.5.2 Potential construction impacts on material assets - resource use

Resource use considered in this assessment includes the materials to be used during the construction phase of the proposed development. The indicative quantities of key materials required for the proposed development are shown in Table 19-10.

Table 19-10 Estimated material quantities

Material	Unit	Quantities
Concrete	m ³	70011
Secant pile foundation (concrete)	m ³	10411
Blinding concrete	m ³	11401
Fill to structures/acceptable fill	m ³	901202
Reinforcement	t	8718
Steelwork	t	2647

Material	Unit	Quantities
Pavement	m ²	46511
Footways	m ²	1370
Kerbs	m	40710
Brickwork and blockwork	m ²	10956
Ballast	m ³	58475
Rails	t	3577
Sleepers	nr	37208
Turnouts	nr	93
Cables	m	1254026
Steel poles	nr	660
Parapet	m	671
Geotextiles	m ²	14325
Bollards 15m spacing	nr	106
Piling	nr	373
Cabinets and Ancillary	nr	1011

The choice of whether to use primary or secondary or recycled aggregates, or a combination of both, will be made by the Contractor and they are assumed to take into account the consideration of several factors, such as materials availability, quality, specification, production, transport and cost. Iarnród Éireann will pursue procurement of the highest recycled steel content that is available for the particular steel usage. This may vary depending on engineering constraints. It should also be noted that Iarnród Éireann are committed to implementing and maintaining the Green Public Procurement process and therefore circular economy principles will apply.

The assessment of effects on material assets considers the achievement of material recovery/ reuse of non-hazardous C&D waste to substitute use of the primary materials and the recycled/re-used content of imported aggregates. For the proposed development, the likely effects are assessed as being *moderate adverse and significant* as the average reusability is at 60% (Table 19.12).

19.5.3 Potential construction impacts on waste

19.5.3.1 Demolition

The proposed works at Connolly Station will create a new access and egress for the station to accommodate for an increased passenger demand. The modifications required at Connolly Station will require some demolition of existing structures. Iarnród Éireann maintenance facilities located in North Wall will be required to be demolished in order to accommodate a permanent construction compound. Demolition will also be required at both Ashtown and Coolmine stations whereby the existing canal pedestrian and cycle crossing, the existing station bridge crossing and the bicycle shelter and the existing station facilities will have to be removed to accommodate the new respective pedestrian and cycle bridge. Some demolition work is also proposed at existing structures (OBG5, OBG11, OBG14 and OBD228).

Majority of the waste which is predicted to arise as a result of demolition will be classified as either inert or non-hazardous wastes including concrete, bricks, glass and metals. However, hazardous waste is also predicted to arise when demolishing existing buildings, structures and infrastructure to include materials such as Asbestos Containing Materials (ACM), bituminous, oils, and chemicals. A survey of the Iarnród Éireann maintenance buildings located in North Wall will be required to identify the types of asbestos containing materials and identify suitable handling and packaging and disposal to a licenced waste facility as per legislative requirements, however it is assumed at detailed design stage that asbestos is present in all buildings to be removed in North Wall. At Connolly Station, the proposed solution will involve amendments to the

structure and removal of these materials to accommodate the new entrance, lift and installation for these repurposed spaces. This will involve partial removal of structural materials and construction of supports for the new structural arrangements. These are likely to be contaminated based on the existing conditions as observed during inspections and investigations. Table 19-11 provides the estimated quantities of demolition waste to arise from the proposed development.

Table 19-11 Estimated quantities of demolition waste

Waste type	Indicative waste classification	Total tonnage	Quantity of demolition waste to be reused, recycled, recovered (tonnes)	Quantity of demolition waste to be sent for disposal (tonnes)
Connolly station				
Concrete	Hazardous	1176	0	1176
Brick	Hazardous	242	0	242
Maintenance facilities located in North Wall				
Asbestos	Hazardous	0.26	0	0.26
Steel	Inert	54	38	16
Concrete	Inert	700	490	210
Brick	Inert	1121	785	336
OBG5				
Masonry	Inert	138	97	40
Ashtown Station				
Steel	Inert	31	22	9
Coolmine Station				
Steel	Inert	34	24	10
OBG11				
Masonry	Inert	175	122	52
OBG14				
Masonry	Inert	138	97	41
OBD228				
Concrete	Inert	2827	1979	850
Steel	Inert	2536	1775	761

Without mitigation, the proposed development is estimated to dispose approximately 2325 tonnes of inert or non-hazardous waste and 1418 tonnes of hazardous waste from demolition.

Additionally, the required foundations for the OHLE and the track lowering construction activities will give rise to railway line ballast and subgrade soils that will have to be disposed of. The estimated quantity is 47,368 tonnes.

19.5.3.2 Excavated material

There will be impacts associated with earthworks including the generation of materials such as soils, subsoils, rocks, made ground, asphalt. Some of this excavated material might not be suitable for reuse, cannot be reused on the proposed development or will be classified as a waste unless it can meet the by-product test conditions.

The estimated amounts of 'cut' or excavated material, the estimated percentage of reusability within the proposed development and estimated disposal volumes is provided per Zone in Table 19-12. For the purpose of assessment, the worst-case for waste generation are considered (an increase of 20% from the in-situ

volume) to account for bulking of the material during excavation and transport. The volumes have been converted into tonnes using a conversion factor of 2.1t/m³.

The main construction works that have been considered in Table 19-12 include:

- Permanent way track lowering and realignment
- Substations and technical buildings
- Spencer Dock (and Spencer Dock permanent way)
- Sidings
- Compensatory storage areas
- Connolly Station
- Level crossings and associated structures
- OHLE foundations
- Bridge structures
- Depot and associated infrastructure

Table 19-12 Estimated excavated material quantities for disposal

Zone	Total Bulk Volume Cut (m ³)	Total Cut (tonnes)	Average % of reusability	Estimated disposal (tonnes)
Zone A	2,428	4248	50%	2124
Zone B	144,839	253,468	49%	149,729
Zone C	72,676	127,182	64%	44,600
Zone D	6,242	10,924	65%	3,823
Zone E	13,048	22,833	65%	7,992
Zone F	337,765	591,089	65%	206,881
Total			60%	415,150

19.5.3.3 Hazardous material

The GI and testing information confirm that the most sensitive sections from a land contamination perspective are in Zones A and B where the levels of pollution in the ground below the railway and its vicinity are assumed to be higher, consistent with historical uses in these areas. Refer to Chapter 9 Land and Soils for further information on contaminated soils. The exact quantities of material that are classified as hazardous waste cannot be determined at this stage. However, it is assumed that 15% of the arisings from Zone A and B will be contaminated, therefore equating to 22,778 tonnes of hazardous waste.

Aforementioned, the required foundations for the OHLE and the track lowering construction activities will give rise to railway line ballast that will have to be disposed of. The estimated quantity is 47,368 tonnes. It is assumed that 65% of the ballast is potentially contaminated, therefore 30,789 tonnes will have to be treated at a hazardous landfill site and 16,579 is considered to be non-hazardous.

19.5.3.4 Summary

Table 19-13 provides a summary on the quantity of C&D waste that is classified as inert, non-hazardous and hazardous.

Table 19-13 Summary of predicated waste quantities arising from the proposed development

Waste classification	Estimated quantity for disposal (tonnes)
Hazardous waste	54,985
Non-Hazardous waste	408,951
Inert waste	2325

The proposed development would result in more than 1% reduction or alteration in the regional inert and non-hazardous landfill capacity. The likely effects are therefore assessed as being *moderate adverse* and *significant*. There is significant scope for re-use and recycling of materials and waste (such as earthworks surplus, topsoil) from the proposed development but the quantity achievable will be dependent on the

Contractor, and therefore cannot be determined more accurately at this stage. However, the construction sector seeks to recycle and re-use construction waste in response to legislative, fiscal and policy drivers as well as cost minimisation, which would result in a likely reduction in the quantity of material that would leave site and require disposal to a landfill.

An estimated 54,985 tonnes of hazardous waste have been identified and would need to be disposed of outside of the EMR and possibly exported. Therefore, the likely effects are assessed as being *moderate adverse* and *significant*.

19.5.4 Potential operational impacts on resource use and waste

DMRB LLA110 (2019) guidance specifies that the environmental assessment should report on the construction phase and first year of operational activities (opening year). No significant maintenance activities would occur during the first year of operation, and therefore no significant materials consumption is anticipated. Operational impacts associated with material waste management at the new Spencer Dock Station has also been scoped out of the assessment as the only waste anticipated is small quantities of general waste generated by the public.

For the proposed depot, the waste streams and estimated quantities anticipated are provided in Table 19-14. This is based on what has been produced by an existing EMU depot in 2019.

Table 19-14 Proposed Depot operational waste streams and estimated disposal quantities

Waste stream	Indictive waste classification	Estimated quantity
General waste (tonnes)	Non-hazardous	30
Metals (tonnes)	Inert waste	0
Interceptor oily water (litres)	Hazardous	1880
Waste oil (kg)	Hazardous	50
Septic (kgs)	Hazardous	7000
Empty steel drums	Hazardous	180
Oily waste (dry,kg)	Hazardous	50

For the general and inert waste streams, the proposed development would result in less than 1% reduction or alteration in the regional inert and non-hazardous landfill capacity and therefore is assessed as being *slight adverse* and *not significant*.

The hazardous waste steams would need to be disposed of outside of the EMR and possibly exported. Therefore, the likely effects are assessed as being *moderate adverse* and *significant*.

Chapter 4 Description of the Proposed Development in Volume 2 of this EIAR includes a Sustainability Strategy for the depot in accordance with the waste hierarchy. For the assessment of fuel/energy resource use this is assessed in Chapter 13 Climate of this EIAR.

19.6 Mitigation and monitoring measures

All materials consumed and waste generated by the proposed development will be managed in accordance with circular economy principles and the waste management hierarchy, with prevention, reuse, recycling and other recovery methods favored over disposal. The following are the mitigation measures to be implemented to avoid, reduce and mitigate potential impacts to the environment.

- 1) Throughout the design and construction of the proposed development, solutions will be required to be considered to minimise the consumption of materials and the generation of waste throughout the lifecycle of the proposed development. (Refer to the CEMP, Designing for a Circular Economy).
- 2) Waste generated during the construction phase will be carefully managed according to the accepted waste hierarchy which gives precedence to prevention, minimisation, reuse and recycling over disposal with energy recovery and finally disposal to landfill.
- 3) All waste removed from the site will be required to be collected by only valid waste collection permit holders. All facilities to which waste will be taken will have appropriate waste licenses or permits, under the Waste Management Act 1996, as amended, and the regulations thereunder.
- 4) Prior to the start of any construction/demolition works, an asbestos survey and detailed site investigation campaign and a Remediation Strategy will be developed prior to site clearance works and the subsequent construction of the site. The Asbestos Surveys and a Remediation Strategy will inform the site clearance strategy and removal of asbestos from the associated site(s).
- 5) For all site clearance works and excavation works, suitably qualified, experienced, licensed and trained personnel will be required to undertake this specialist work such as those specified in accordance with the 'measures for working with asbestos'. Any Asbestos Containing Materials (ACMs) discovered in areas required for excavation, will be required to be disposed of by a licensed contractor to a licensed waste facility in accordance with waste management legislation, as appropriate.
- 6) A CEMP will be prepared by the Successful Contractor during the construction phase to ensure commitments included in the statutory approvals are adhered to, and that it integrates the requirements of the EOP and the CDWMP and Incident Response Plan (IRP) during all construction works. See Appendix A5.1 Construction Environmental Management Plan in Volume 4 of this EIAR and its appendices for details of these plans.
- 7) It will be the responsibility of the Contractor to appoint a Waste Management Co-Ordinator (WMC) to assume responsibility for the further development of the CDWMP and the management and treatment of all waste materials generated during the construction phase of the proposed development.

19.7 Residual Effects

Residual impacts are the final or unintended effects which occur after the proposed mitigation measures have been implemented. Table 19-15 provides a summary of residual effects in relation to consumption and use of material assets and the generation and management of waste.

Table 19-15 Summary of potential effects

Criteria	Predicted impacts	Significance of effect	Residual effects
Material assets	Recovery of construction and demolition waste.	Moderate adverse	Slight adverse
	Use of aggregate comprising re-used/recycled content in line with the relevant regional or national target.	Moderate adverse	Slight adverse
Waste	Management and disposal of inert and non-hazardous waste.	Moderate adverse	Slight adverse
	Management and disposal of hazardous waste.	Moderate adverse	Moderate adverse

19.8 Cumulative effects

As part of the resource use and waste management assessment, the totality of the resource use and waste for the proposed development has been assessed as part of this chapter. Following mitigation measures, from the material assets perspective, the likely effects are *slight adverse* and *not significant*. In terms of non-

hazardous waste, the likely effects are *slight adverse* and *not significant*. For hazardous waste, impacts are rated as *moderate* and *significant*.

The cumulative assessment of relevant plans and projects is undertaken separately in Chapter 26 of this EIAR.

19.9 References

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