

SECTION 15: Resource and Waste Management

15.1 Introduction

15.1.1 Background

This Section of the EIAR assesses the potential impacts (and resulting effects) likely to occur as a result of the Proposed Castletroy Wastewater Treatment Plant (WwTP) Upgrade Project on the receiving environment, in terms of waste management. This assessment is in line with the *EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports and Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment*.

The impact assessment includes an accurate description of all aspects of the Proposed Development during construction and operation. The Section then completes a thorough assessment of the impacts of the Proposed Development due to its resource and waste management strategy. Where likely ecologically significant effects are identified, measures are prescribed to avoid or minimise or compensate for such effects.

15.2 Assessment Methodology

The potential for waste to be generated during the excavation, construction and operation phases of the Proposed Development is assessed. Mitigation measures are identified where necessary to reduce the impact of the waste generated by the Proposed Development in the construction and operational phases. The principal objective of sustainable resource and waste management is to use material resources more efficiently, where the value of products, materials and resources is maintained in the economy for as long as possible and the generation of waste is minimised. To achieve resource efficiency there is a need to move from a traditional linear economy to a circular economy.

Where residual waste is generated, it should be dealt with in a way that follows the waste hierarchy set out in the EU Waste Framework Directive (Directive 2008/98/EC) (see Figure 15-1) and actively contributes to the economic, social and environmental goals of sustainable development. This Section examines the potential environmental effects of the generation and management of solid waste arising from the Proposed Development, in the context of the existing local and national resource and waste management environment.



Figure 15-1: Waste Hierarchy

15.2.1 Desktop Study

A comprehensive desktop study was undertaken to inform this environmental impact assessment. This study includes a thorough review of available information that is relevant to the waste management of the site of the Proposed Development, which included the following tasks:

- Review of relevant policy and legislation which creates the legal framework for resource and waste management in Ireland including the Southern Region Waste Management Plan 2015-2021 and the Uisce Éireann’s National Wastewater Sludge Management Plan 2016;
- Description of estimated waste generation during the construction, operational and decommissioning phases; and
- The Proposed Development was systematically reviewed to identify mitigation and move waste management up the waste hierarchy through implementation of best practice.

Mitigation measures are proposed to minimise the effect of the Proposed Development on the environment, reduce the quantity of waste sent for final disposal in so far as possible and to promote sustainable waste management practices. These are described in **Section 15.6**. The construction strategy for the Proposed Development is set out in **Section 5**. The direct and indirect effects of transport (which includes traffic associated with the movement of waste material) are considered in **Section 7** and the geological characterisation of the Proposed Development is considered in **Section 14**.

Construction Waste

Construction waste, including excavation waste, will be generated as a result of the Proposed Development. In order to establish a baseline and review capacity in relation to construction waste, a review of published data and statistics was undertaken. The most recent complete figures published by the EPA relating to construction and demolition waste are for the year 2019 with 8.74Mt (million tonnes) of C&D waste finally treated (recovered or disposed). In the year 2019 with a vast majority (9%) of C&D waste underwent final treatment in Ireland and only 4% (359,812 tonnes) was exported abroad for final treatment. Soil and stones accounted for 85% of C&D waste generated and collected in 2019 (up from 77% in 2017), while the next largest C&D waste types in 2019 were concrete, brick, tile and gypsum waste (7%) and mixed C&D waste (4%).

The EPA states that: “With a government policy focus on the provision of social housing, major road infrastructural projects and the new children’s hospital, construction and demolition waste generated will increase again in the coming years.” The nearby Southern Regional Waste Management Strategy 2015-2021 reports that 970,319 tonnes of construction and demolition waste was collected within the region in 2012. An indicative breakdown of the composition of construction and demolition waste in Ireland in 2019 is set out in Figure 15-2. These figures should be considered as a guide only as construction and demolition waste can vary significantly from one project to another, depending on the nature of the development and the waste management practices employed on-site. Soil and stones accounted for almost 84.8 % of the total quantity of construction and demolition waste finally treated in 2019 and is a significant waste stream in terms of quantity arising. The quantity of contaminated soil (hazardous waste) has also increased due to increasing construction activity in recent years.

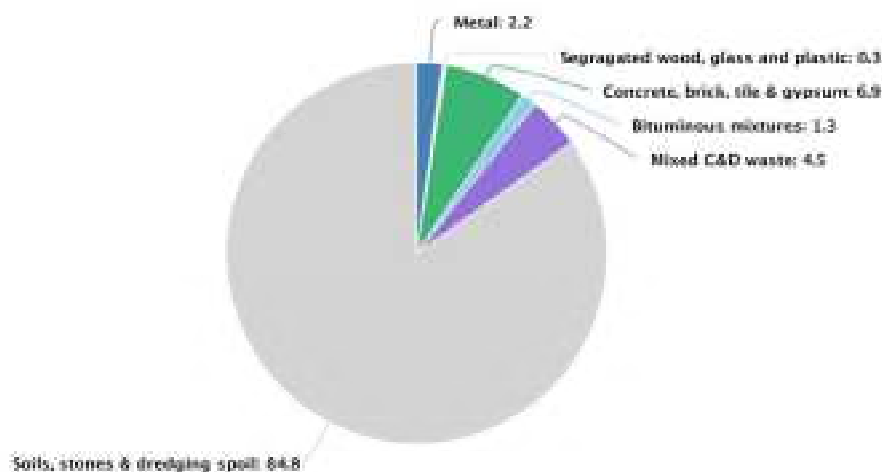


Figure 15-2: Composition of C&D Waste generated in Ireland, 2019 (Source: EPA)

Draft Limerick Development Plan 2022-2028 notes that, construction related waste accounts for a significant proportion of total landfill waste in Ireland. The New Waste Management Plan for Limerick, 2015 mentions that household recovery/recycling rate of 63% and a commercial recovery/recycling rate of 61% have been achieved.

Limerick is one of ten local authority areas that comprise the Southern Region covered by the SRWMP 2015 – 2021. The overarching aim of that plan is to prioritise waste prevention and, for that waste, which is produced, to ensure that the majority is reused, recycled and recovered in order to minimise waste disposal. The SRWMP provides a framework for the prevention and management of waste in a safe and sustainable manner.

For the region as a whole, it was estimated in the SRWMP that, for 2012, 59% of municipal waste (household and commercial) was recovered.

Targets for 2020 include:

- 50% of household and similar waste to be reused and recycled; and
- 70% of construction and demolition waste to be reused, recycled and recovered.

Operational Waste

The solid wastes typically generated during operation of a WwTP of this nature include sludge from wastewater treatment, grit and other materials from the inlet works screening processes, maintenance and office wastes. In 2016 Uisce Éireann published the National Wastewater Sludge Management Plan (NWSMP) outlining its standardised nationwide approach for managing wastewater sludge for the next 25 years. In 2019, wastewater treatment plants produced 58,630 tonnes of sewage sludge, according to *Ireland's Environment – An Integrated Assessment 2020*. Sludge is rich in nutrients and is primarily used as a soil improver or fertiliser on agricultural land. All the sludge sent for composting was subsequently used in agriculture. In the Southern Region (Southern Region Waste Management Plan 2015-2021) 144,525 tonnes of sludges were collected in 2012. An additional 7,255 tonnes of water treatment sludges were also collected.

15.2.2 Guidance and Legislation

The following section outlines the legislation and guidelines considered, and the adopted methodology for preparing this Section and undertaking the resource and waste management assessment.

- Guidelines on the information to be contained in Environmental Impact Assessment Report by the Environmental Protection Agency (EPA, 2022);
- European Union (Waste Management) (Environmental Impact Assessment) Regulations 2020;
- Best Practice Guidelines for the preparation of Resource & Waste Management Plans for Construction & Demolition Projects (EPA, 2021)
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment, (Department of Housing, Planning and Local Government, 2018)

Resource and waste management takes place in a policy and legislative framework. A review of relevant legislation, policy and best practice guidance was undertaken to inform the impact assessment and recommended mitigation. The key components of EU, national and local policy, legislation and guidance relevant to the Proposed Development are summarised as follows:

- Prevention of waste is the preferred option such that the value of products, materials and resources are maintained in the economy for as long as possible, the generation of waste is minimised, and the principles of circular economy are implemented;
- Where construction waste is generated, it should be source separated to facilitate reuse, recycling and maximise diversion of waste from landfill;

- Where operational waste is generated, it should be source separated to facilitate reuse, recycling and maximise diversion, including biodegradable waste, from landfill;
- Where waste may not be prevented, reused or recycled it should be transported and disposed in accordance with the Waste Management Acts 1996 to 2011; and
- Waste may only be transferred from site by a waste collection permit holder and delivered to an authorised waste facility (i.e. a facility which holds a Certificate of Registration, Waste Facility Permit or Waste Licence).

In accordance with the objectives of Irish Water's WSSP, a National Wastewater Sludge Management Plan (NWSMP) aims to ensure that the management of wastewater sludge over the next 25 years is standardised nationwide. The NWSMP was published in September 2016. The objectives of Uisce Éireann outlined under page 5 of the NWSMP are:

- To avoid endangering human health or harming the environment;
- To maximise the benefits of wastewater sludge as a soil conditioner and source of nutrients;
- To ensure that all regulatory and legislative controls are met, and due regard is taken of non-statutory Codes of Practices and industry guidance;
- To establish long term, secure and sustainable disposal routes and outlets;
- To ensure cost-effective and efficient treatment and reuse/disposal techniques;
- To reduce potential for nuisance from sludge transport and sludge facilities;
- To extract energy and other resources where economically feasible; and
- To drive operational efficiencies, e.g. through use of Sludge Hub Centres.

15.3 Baseline Conditions

The Castletroy Local Area Plan (LAP) covers approximately 11.2 square kilometres (1,123.47 hectares) in area which makes this Proposed Development a Tier 2 project as per EPA Regional Waste Management Plan (RWMP) Best Practice Guidelines. And this indicates the minimum content requirements for developing a Tier 2 RWMP at project level in advance of construction should be covering the following phases:

- Design phase including the project conception, preliminary, outline and detailed design phases, as applicable.
- The statutory planning phase under the Planning and Development Act 2000 (as amended); and
- Procurement of contractor services and materials.

15.3.1 Site Specific Ground Investigation

Uisce Éireann commissioned Whiteford Geoservices Ltd to undertake a ground investigation (GI) produced the report: Site Investigation - Factual Report No. P2099-21C Dated - February 2022 (**Appendix 13B**), at the Castletroy WwTP site, designed by J.B. Barry and Partners.

The made ground is described as firm to stiff, brown, slightly sandy, gravelly CLAY with many cobbles and some boulders. Occasional concrete, plastic, timber, tar fragments and steel re-bar were also reported present. Soft silt and clay was encountered underlying made ground in all exploratory holes at depths ranging from 1.6m to 3.9m bgl. Peat was encountered in all boreholes, underlying or interbedded with the soft silt and clay. Granular glacial till was encountered underlying soft silt and clay in all boreholes, at depths ranging from 4.5m and 3.7m bgl. Cohesive glacial till was encountered in *BH/RC02* interbedded with granular glacial till between 9.0 to 11.0m bgl. The underlying bedrock is described as weak to medium strong, fine grained, LIMESTONE. Rotary cored boreholes (RC01 and RC02) report encountering rock at depths of 10.4m bgl and 11.0m bgl, respectively.

The ground investigation indicates the superficial deposits predominantly comprise a combination of made ground and soft silt and clay, overlying glacial till and limestone bedrock. This is broadly consistent with the

published Geological Survey of Ireland (GSI) mapping¹³ which reports Estuarine silts and clays overlying Viséan Limestone.

The following geotechnical risks have been identified based on the subsurface conditions encountered at the site and have been recorded in the Geotechnical Risk Register (Refer to Appendix 19 of the detailed design report). These include:

- Collapsible ground;
- Compressible ground;
- High groundwater levels (groundwater control);
- High permeability granular layers (groundwater control);
- Excessive total and/or differential settlement (due to consolidation, groundwater control, excavation); and
- Potentially contaminated soil (made ground).

These risks will need to be assessed in terms of potential impact on both permanent and temporary works and should be mitigated as much as reasonably practicable as part of the final design solution.

15.3.2 Asbestos Refurbishment Survey

OHSS carried out an asbestos survey to HSG264 requirements for the purposes of identifying asbestos containing materials in the premises(s) prior to the refurbishment of the area. The scope of this survey included a refurbishment asbestos survey of Castletroy WWTP to facilitate planned works at the property. This report 'Asbestos Refurbishment Survey Report' can be accessed in **Appendix 15A**.

The findings and analysis of this survey concludes that, the survey did not identify asbestos containing materials in the building; it should be noted that asbestos containing materials may be concealed or buried on site. Staff undertaking refurbishment work should be trained in asbestos awareness and should any suspect materials be found; this should be brought to the attention of the project supervisor for construction stage and the designers.

15.3.3 WwTP Waste Outputs

Sludge Production

There are currently 3 types of sludge produced as a byproduct of the Castletroy WwTP liquid stream process: dewatered primary sludge, sludge cake and liquid sludge which are removed to off-site licenced facilities for further treatment and final disposal in accordance with EU Code of Good Practice for Use of Biosolids in Agriculture and Irish Water's National Wastewater Sludge Management Plan (NWSMP).

Dewatered primary sludge – the existing Salsnes primary treatment filters produce 43m³ /1 trailer load of dried sludge every 2-3 weeks. This sludge has a high dried solids content of c.30% (DS) which is not suitable for the intake facility at the nearby Sludge Hub Centre in Bunlicky. Therefore, it is transported to an alternative licenced facility in Kilkenny named AQS. They use a combination of composting and anaerobic digestion to convert the primary sludge into a Class A biosolid suitable for use in agriculture.

Sludge cake – surplus/waste activated sludge (SAS / WAS) from the secondary processes (aeration and secondary treatment) is mixed in thickening tanks then dewatered to 14% dry solids (DS) content. The WwTP produces 215m³ /5 trailer loads of sludge cake per week which is transported to Bunlicky Sludge

¹³ GSI web viewer address; <https://www.gsi.ie/en-ie/data-and-maps/Pages/default.aspx>

Hub Centre. It then goes through the anaerobic digestion process whereby it produces biogas and electrical energy for use onsite at Bunlicky. Digested, dewatered sludge cake is removed from the Bunlicky site by a licenced contractor (ENVA) and undergoes lime stabilisation to produce a Class A biosolid. The final destination is for use as a fertiliser on agricultural land (landspreading).

Liquid sludge – the dewatering equipment at Castletroy is unable to handle the volume of sludge currently being produced by the WwTP. As a result, 93m³ /3 tankers of liquid sludge at 2-3% DS is extracted from the process stream and transported directly to Bunlicky WwTP and discharged into the main treatment process stream. It undergoes primary and secondary treatment as well as full sludge treatment, i.e. dewatering, digestion, removal to off-site lime stabilisation and landspreading. This is the most costly and least preferred route from an operational perspective.

It should be noted that the sludge dewatering process in Castletroy is currently not in compliance with the NWSMP's Sludge Transport Strategy. The strategy has been developed to reduce cost and environmental impacts associated with sludge vehicle movements on the roads. Removing excess liquids by dewatering sludge prior to transport is key to the plan, which states; '*All wastewater treatment plants with a population equivalent greater than 10,000 p.e. should include sludge dewatering to a minimum of 18% dry solids.*'

Screening/Grit Removal

Screenings from the inlet works, SWO's and grit removal operations are collected by suitably permitted contractors and disposed of at an appropriately licensed facility in accordance with the Waste Management Acts, 1996 to 2011. Approximately 7 m³ of screenings (including grit) are typically produced by the WwTP per week.

Municipal Waste

Waste resulting from administrative offices and maintenance requirements is categorised as non-household municipal waste. Municipal office and food waste is generated from the Administration Building and collected by a commercial waste collector as part of their regular waste collection service in the Castletroy Area.

15.4 Characteristics of the Proposed Development

The main construction works relating to the Proposed Development include the installation of stormwater holding/storage tank, a primary filter building, sludge thickening tanks and pumping stations (forward feed PS, stormwater return PS and flood event PS). There will be various periods of excavations and possibly removal of contaminated soils due to the presence of invasive species required during the construction phase. There are also proposed retrofit works included in the design such as the installation of IFAS frames and upgrading of the air blowers in the existing aeration tanks. Removal of existing dewatering equipment and installation of new centrifuges in the sludge building is also proposed. Those and all other aspects of the works have been considered in terms of potential waste generation and management in this assessment. See development proposal in section for further details **Section 3**.

Following the Proposed Development works, primary and secondary sludges will be combined and dewatered onsite to a minimum of 18% dry solids. Therefore, the current arrangement i.e. removal of dewatered primary and liquid sludges, will no longer be required. Given the 10-year growth projections of 77,500PE, the WwTP is expected to produce an average volume of 180m³ sludge cake per week. Screenings and grit production will also increase to approximately 12.6m³ per week. Increases in municipal waste will be negligible as staff numbers will remain the same. Details and impacts during the operational phase are discussed further in **Section 15.5.3**.

15.5 Likely Significant Effects

15.5.1 Do-Nothing Scenario

The do-nothing scenario refers to what would happen if the Proposed Development was not implemented and the WwTP continues to operate at the current design PE.

The sludge dewatering equipment is not able to handle the existing sludge production rates from the WwTP liquid line. As mentioned previously, 93m³ of liquid sludge is being transported to Bunlicky for treatment every week, which is not in line with the NWSMP's sludge transportation strategy. The demands of population growth and industrial development will cause the WwTP to produce increasingly higher volumes of sludge in the coming years. This will require additional tankers of liquid sludge to be removed on a weekly basis which will exacerbate non-compliance with the NWSMP and is likely to result in negative financial and environmental impacts.

15.5.2 Assessment of effects during construction

Site Clearance

Prior to commencing work, the contractor will need to strip surface material within the working areas for the Proposed Development. This will comprise soils, rock, topsoil, vegetation etc., which is typical of a project of this nature and scale. This material will be reused within the Proposed Development in so far as reasonably practicable, or transferred for recovery or disposal at appropriately authorised waste facilities in respect of which a waste permit or a waste licence is granted.

Modification to Sludge Dewatering Building

The first floor of the sludge dewatering building will be removed to accommodate the new equipment. This will involve the removal of structural beams, which support the steel grating floor on which the existing dewatering equipment is installed.

Excavation

Topsoil, soil, rock and naturally occurring material excavated in the course of construction activities will be reused within the Proposed Development where feasible, subject to further testing to determine if materials meet the specific engineering standards for their proposed end-use. Where naturally occurring material is used for the purpose of construction in its natural state within the Proposed Development this material is not deemed to be a waste in accordance with Article 2 of the Waste Directive 2008/98/EC, the European Communities (Waste Directive) Regulations, 2011 and Section 3 of the Waste Management Acts, 1996-2011 as amended. Reuse must be certain, there must be no intention or requirement for it to be discarded and no further processing required in order for it to be reused.

All excavated material will be disposed of at a suitable licensed facility in respect of which a waste permit or a waste licence is granted if there is no opportunity for reuse on site. The majority of the overburden material within the stormwater storage tank footprint is unlikely to be suitable for re-use as an engineered fill. Excavations in made ground will be monitored by an appropriately qualified person to ensure that any evidence of contamination (e.g. asbestos, hydrocarbons, etc.) encountered are identified, segregated and appropriately contained.

One of the main types of C&D wastes (and waste costs) generated from construction sites is soil and stone removed from site excavations. It is imperative that the Contractor considers this element at the outset with a view to managing disposal/recycling of this stream in so far as possible. The following should be considered as part of this process:

- Balance cut and fill on site to minimise the import and export of materials (topsoil) for site works and facilitate the use of excavated materials on site.
- Revise site layout and levels to minimise excavation work, i.e. use the existing topography where possible to minimise the need for excavation.
- Utilise split level design on sloping sites.

- Reuse excavated materials on site where possible, e.g. reuse excavated rock for drainage layers, landscape fill, planting features or reuse excavation materials directly as spoil to level the site.
- Set aside good quality and high value materials from existing hard and soft landscaping for reuse on site, where appropriate e.g. use of concrete paving, flagstones for new landscape areas, produce compost from soft vegetation. Where tarmac and asphalt arises, it should be sent off-site for appropriate management.

Storm Water Storage Tank and Other Excavations

The stormwater storage tank is located near the centre of the site and the structure will extend up to approximately 2.3m above ground level and up to approximately 5.3m below ground. excavated material will generally comprise of made ground overlying soft silt and clay. Soft soil located at the base of the excavation will also require excavation. No rock breaking or rock stripping are envisaged for the construction works.

Table 15.1: Estimated Bulk Materials Quantities and Management during Construction

Nature	Structure	Nature / Source	Quantity (m ³)
Export	Stormwater storage tank	Non-hazardous Excavation Material	6223
	Filter Building & Splitter Chamber		650
	Picket Fence Thickener		540
	Forward Feed Pumping Station		508
	Flood Event Pumping Station		253
	Primary Sludge Holding Tank		245
	Wash Water Tank		114
Total Excavated Materials			8533

Excavated material is likely to predominantly consist of soil and stones with some non-hazardous materials such as uncontaminated made ground and bitumen. There are likely to be some hazardous materials such as contaminated soils.

Summary

Approximately 8533 m³ of excavated material will be generated during construction of the Proposed Development. Of this it is estimated that all of excavated material will be categorised as non-hazardous or hazardous in accordance with Council Directive 99/31/EC of 26 April 1999 on the landfill of waste and will require removal from site to authorised facilities in Ireland or abroad.

General Construction Waste

Construction works, site offices and temporary works facilities are also likely to generate waste. Construction waste can vary significantly from site to site but typically may include the following non-hazardous fractions:

- Soil and stone;
- Concrete, brick, tiles and ceramics;
- Asphalt/tar;
- Metals;
- Wood; and
- Other.

The hazardous waste streams which could arise from construction activities may include the following:

- Waste electrical and electronic components;
- Batteries;
- Asbestos;
- Wood preservatives;
- Liquid fuels; and
- Contaminated soil.

Also included within the definition are surplus and damaged products and materials arising in the course of construction work or used temporarily during the course of on-site activities. In the case of the Proposed Development, the most likely type of construction waste will be surplus concrete and unusable or damaged pipe segments which may arise on site.

Removal of Temporary Works

Following completion of construction, temporary sheet piles will be extracted and removed. Excavated material will be hauled off site. This material will be delivered for recovery or disposal at licensed and/or permitted facilities in respect of which a waste permit or a waste licence is granted.

Construction Waste and the Waste Hierarchy

Uisce Éireann is committed to sustainable waste management and the waste management hierarchy set out in the EU Waste Framework Directive (Directive 2008/98/EC). The construction of the Proposed Development is reviewed below in the context of the waste hierarchy.

Prevention

Waste prevention and minimisation is the most environmentally sustainable means of managing excavated material and construction wastes. Prevention and minimisation of waste is inherent in the design of the Proposed Development. As mentioned previously, where naturally occurring material is used for the purpose of construction in its natural state within the Proposed Development this material is not deemed to be a waste in accordance with Article 2 of the Waste Directive 2008/98/EC, the European Communities (Waste Directive) Regulations, 2011 and Section 3 of the Waste Management Acts, 1996-2011 as amended.

Preparing for reuse

The next preferable option in the waste hierarchy is beneficial re-use of surplus excavation spoil as engineering and landscaping material within the Proposed Development and on other projects requiring the types of materials generated. Reuse of topsoil and excavated material within the Proposed Development is proposed subject to availability of temporary storage space during the construction phase. The material is also subject to testing to ensure it is suitable for its proposed end use.

Where construction by-products are proposed to be further used on or off site this will take place in compliance with Article 27 of the European Communities (Waste Directive) Regulations, 2011. The contractor will be responsible for ensuring compliance with these Regulations where appropriate.

Recycling, Recovery and Disposal

A significant proportion of surplus excavation material from the Proposed Development will consist of soil and stones which can be accepted for recovery and recycling at EPA licensed and permitted facilities. Recycling/ recovery activities include:

- Processing of stone to produce construction aggregate;
- Backfilling of quarries; and
- Raising land for site improvement or development.

The option of delivery of inert uncontaminated material for disposal to landfill is the least desirable destination for surplus material generated by the Proposed Development and will only be considered where sufficient void capacity cannot be secured at appropriately licensed/permitted facilities for recovery purposes. It is unavoidable that a small percentage of excavation material, due to the presence of contaminants will have to be disposed of off-site. All material presented for disposal will have to meet the receiving sites waste acceptance criteria.

Where material for reuse within the Proposed Development will be processed through crushing and screening to achieve required specifications for end use the contractor will obtain the appropriate permit or licence from Limerick City and County Council or the EPA prior to commencement of these activities. Where removal of waste from site is required, this will be delivered for recovery or recycling at facilities holding a Certificate of Registration, Waste Facility Permit or EPA Waste Licence.

15.5.3 Assessment of Effects during Operation

During the operational phase, waste products generated by the WwTP will be sludge cake, screenings and grit, municipal waste and maintenance waste.

Sludge Disposal

The sludge produced by the Proposed Development will be thickened and dewatered to a minimum 18% dry solids, for appropriate disposal in accordance with the Uisce Éireann National Wastewater Sludge Management Plan (NWSMP). The anticipated peak daily volume of dewatered sludge cake which will be produced is estimated at 26m³ per day (calculated from the +10 PE projections), which will require 2 no. lorry removals per day.

The NWSMP states that '*use of existing anaerobic digestion infrastructure should be maximised to increase energy recovery*', therefore, Bunlicky Sludge Hub Centre will continue to be the primary route for future sludge produced by the WwTP. However, in the absence of available capacity at Bunlicky, the dewatered sludge will be transported to one or a number of licenced facilities that can provide treatment and final disposal that comply with Code of Practice, Domestic Wastewater Treatment Systems (2021), EU Code of Good Practice for Use of Biosolids in Agriculture and all other relevant legislations.

At present, the most common route for final disposal of treated sludge is to undergo lime stabilisation and produce a Class A Biosolid for reuse in agriculture. Due to the difficulties in controlling off-site activities, it is proposed that treatment of sludge by lime stabilisation is phased out as soon as alternatives can be developed.

The Uisce Éireann Regional Sludge Hub Centre project seeks to create a more efficient national sludge management system by centralising and standardising sludge treatment. Regional Sludge Hub Centres will use thermal hydrolysis, in place of lime stabilisation, to produce a Class A biosolid that can be disposed of safely and in a way that does not pose a risk to public health, the environment or agricultural lands. Bunlicky WwTP has been chosen as the site location for the Southern Regional Sludge Hub Centre. The project is currently at concept design stage and will form part of a separate future planning application.

In the medium term, sludge produced at Castletroy will continue to be treated by lime stabilisation (via Bunlicky Sludge Hub Centre). The reuse of the treated Castletroy WwTP sludge in agriculture is subject to a separate regulatory regime and will be in accordance with an appropriate Nutrient Management Plan and regulated in line with statutory requirements, including those under the EU Code of Good Practice for Use of Biosolids in Agriculture.

The following criteria have been noted regarding storage and landspreading procedures:

- The transportation of biosolids (following appropriate treatment to class A standard) to spread lands or local storage facilities will be seasonal;

- The spread lands currently used for application of biosolids produced at the Castletroy WwTP (via Bunlicky) are located in South Leinster and parts of Munster;
- There is currently no proposal to change the location of the spread lands;
- The non-spreading/storage period according to SI 605 of 2017 is between the 15th October and the 12th January; and
- During this period, biosolids will be stored in suitable licenced storage sites prior to application as a fertiliser the following year.

Screening/Grit Removal

Screenings from the inlet works, SWO's and grit removal operations will continue to be collected by suitably permitted contractors and disposed of at an appropriately licensed facility in accordance with the Waste Management Acts, 1996 to 2011. Approximately 12.6m³ of screenings (including grit) will be typically produced by the WwTP per week. Projections are calculated using IW-TEC-700-99-02 Screening Volume Calculation.

Other Waste

Municipal (non-household) office and food waste generated from the Administration Building will continue to be collected by a commercial waste collector as part of the regular waste collection service in the Castletroy Area. Future volumes of municipal waste are not expected to increase as staff numbers will not change.

Maintenance waste will be generated during maintenance of the sewer network and the wastewater treatment plant. Maintenance contractors will remove maintenance waste generated during the course of their work.

15.6 Mitigation Measures and Monitoring

15.6.1 Mitigation During Construction

Construction Waste

An outline Construction and Demolition Waste Management Plan (CDWMP) is described below. This Outline CDWMP plan will be required to be developed into a Detailed CDWMP by the Contractor(s) following appointment and prior to commencing works on site. The CDWMP addresses waste generation and arrangements made for prevention, reuse, recycling, disposal and collection of recyclables and wastes. The Outline CDWMP was prepared in line with the guidance. The following is an indicative summary of the content of a CDWMP:

- Description of the project;
- Wastes arising including procedures for minimisation/reuse/recycling;
- Estimated cost of waste management;
- Roles including training and responsibilities for C&D waste;
- Procedures for education of workforce and plan dissemination programme.
- Record keeping procedures;
- Waste collectors, recycling and disposal sites including copies of relevant permits or licences; and
- Waste auditing protocols. Using the information identified in this section the contractor will be required to develop, implement and maintain a CDWMP during the construction of the Proposed Development.

Construction – All Phases

In addition to the inherent design measures which will be implemented during construction, the following mitigation measures will also be implemented:

- The contractor will minimise waste disposal so far as is reasonably practicable. Opportunities for reuse of materials, by products and wastes will be sought throughout the construction stage of the Proposed Development.
- Possibilities for re-use of clean non-hazardous excavation material as fill on the site or in landscaping works will be considered following appropriate testing to ensure material is suitable for its proposed end use. Where excavated material may not be re-used within the proposed works the Contractor will endeavour to send material for recovery or recycling so far as is reasonably practicable.
- Waste from the Proposed Development will be transported by authorised waste collectors in accordance with the Waste Management (Collection Permit) Regulations, 2007 as amended.
- Waste from the Proposed Development will be delivered to authorised waste facilities in accordance with the Waste Management Acts 1996-2022 as amended.
- Source segregation: Where possible metal, timber, glass and other recyclable material will be segregated during construction works and removed off site to a permitted/licensed facility for recycling. Waste stream colour coding, and photographs of wastes to be placed in each container as required, will be used to facilitate segregation. Where waste generation cannot be avoided this will maximise the quantity and quality of waste delivered for recycling and facilitate its movement up the waste hierarchy away from landfill disposal and reduce its environmental impact.
- Material management: 'Just-in-time' delivery will be used so far as is reasonably practicable to minimise material wastage.
- Supply chain partners: The Contractor will engage with the supply chain to supply products and materials that use minimal packaging, and segregate packaging for reuse.
- Waste Auditing: The Contractor will record the quantity in tonnes and types of waste and materials leaving site during the construction phase.
- Waste fuels/oils may be generated from equipment used on-site during construction and may be classified as hazardous waste. Such wastes will be stored in a secure, bunded area on-site prior to collection by a contractor who holds the appropriate waste collection permit.
- The name, address and authorisation details of all facilities and locations to which waste and materials are delivered will be recorded along with the quantity of waste in tonnes delivered to each facility. Records will show material which is recovered and disposed of.
- The contractor(s) will ensure that any off-site interim storage or waste management facilities for excavated material have the appropriate waste licences or waste facility permits in place.

15.6.2 Mitigation during Operation

As the impact of operational waste is predicted to be imperceptible no specific mitigation is considered necessary.

15.6.3 Monitoring

During Construction

Monitoring required as part of the CDWMP and/or CEMP as set out in **sections 16.5.1** and **Appendix 4A** in relation to wastes will be undertaken and recorded by the Contractor(s).

During Operation

Monitoring of sludge generation and management will be undertaken in accordance with the provisions of operational procedures for the WwTP and the NWSMP.

No additional monitoring is considered necessary with respect to effects from other operational wastes from the Proposed Development.

15.7 Residual Effects

Following implementation of the mitigation described in **Section 16.5** the residual effects are as follows:

15.7.1 Residual Effects during Construction

The residual effect of excavation waste is expected to be slight, negative and short-term. The impact of general construction waste is expected to be imperceptible and short term.

15.7.2 Residual Effects during Operation

The residual effect of operational waste is expected to be imperceptible and long term.

15.8 Cumulative Impacts

Short term impacts due to construction waste removal are discussed in **Traffic and Transportation, Section 7.**

The outcome of the proposed Southern Regional Sludge Hub Centre planning process will influence the disposal route of Castletroy sludge. Should the project be approved and completed, cake sludge from Castletroy will be transported there where it can undergo the preferred thermal drying treatment process, as per the NWSMP.

The specific lands that will be utilised for the land spreading of the biosolids produced at the Castletroy WwTP and Limerick Sludge Hub Centre, cannot be identified at this time. Specific lands that will be utilised can only be identified at the time when the biosolids are being generated and the nutrient needs of the relevant lands have been identified. This changes from year to year depending on a number of factors. Uisce Éireann does and will ensure that the lands utilised for the landspreading of all biosolids generated by its WwTPs are only those that comply with all relevant laws and regulation, as committed to in the NWSMP.

15.9 References

Guidelines on the information to be contained in Environmental Impact Assessment Report by the Environmental Protection Agency (EPA, 2022)

European Union (Waste Management) (Environmental Impact Assessment) Regulations 2020

Best Practice Guidelines for the preparation of Resource & Waste Management Plans for Construction & Demolition Projects (EPA, 2021)

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

Southern Region Waste Management Plan 2015-2021

Uisce Éireann's National Wastewater Sludge Management Plan 2016