Attachment-4-3-4-R and D Activity Capacity Calculations

D05 - Specially engineered landfill (e.g. placement into lined discrete cells which are capped and isolated from one another and the environment, etc.)

Table 1: D05 Capacity Calculations

Capacity	m3	Details
Proposed Non-Hazardous Landfill	7,250,000	Design capacity of landfill
Existing MSW Landfill	(5,040,000)	Design capacity of landfill
Void Space Used	(4,830,598)	From latest surveyed quantity in December 2023
Existing MSW Landfill (void capacity remaining)	209,411	
TOTAL	**7,459,411**	

This IED Licence application includes for the continuation of acceptance of Non-hazardous household, commercial & industrial and C&D wastes to the existing MSW Landfill until the landfill is filled or at the latest, the end of the current permission for the facility, which is 2028. The applicant acknowledges the European and National policy as well as the waste management industry to move away from landfilling towards a Circular Economy and is cognisant of the State's obligations under the Waste Framework Directive (2008/98/EC & 2018/851/EC), i.e. *"Preparing for reuse and recycling of 50% by weight of household derived paper, metal, plastic & glass by 2020* and the Landfill Directive (1999/31/EC & Amendment Directive (EU) 2018/850), i.e. *Limiting the share of municipal waste landfilled to 10% by 2035"*.

The applicant is also keenly aware of the preference for reuse and recovery of waste over disposal in accordance with the EU waste hierarchy and has established organic waste recovery facilities to maximise the reuse potential of organic wastes. Bord na Móna Recycling's business also provides a high-quality waste collection service to both domestic and commercial customers ensuring maximum source segregation of waste materials with a view to minimising the residual waste quantities going to landfill.

However, it is still a reality that some quantity of residual MSW will require disposal to landfill and the existing Drehid facility is one of only three landfills in the country receiving municipal residual waste [1]. In December 2021, the EPA granted Bord na Móna an additional contingency capacity of 27,500 tonnes, under Section 56A emergency measures, as a result of significant build-up of waste materials in pre-processing facilities and a lack of available permitted landfill capacity in the country. The ongoing provision of MSW

[1] https://www.epa.ie/our-services/monitoring--assessment/waste/national-waste-statistics/infrastructure/ (EPA website accessed on 04 Sept 2023)

landfill capacity to serve mainly the Greater Dublin region is imperative to ensuring Ireland's self-sufficiency and reducing the quantities of residual waste exported from the State. Based on the current permitted rate of waste placement, it is anticipated that the existing landfill will reach its maximum void space capacity early in 2026.

The need for the provision of additional non-hazardous landfill capacity at the site is outlined in detail in Section 4.2 of the Further Development EIAR. In terms of providing capacity for the landfilling of non-hazardous waste, it is noted that 39% of all municipal waste was exported to Europe in 2020[2] The provision of facilities at Drehid for the landfilling of this waste in Ireland will enable the country to move towards being more self-sufficient in the management of these waste streams and not be overly reliant on the export markets.

The available volume capacity in the proposed additional non-hazardous landfill is 7,250,000 m^3, based on the landfill design provided.

The existing MSW landfill had a design volume capacity of 5,040,000 m^3 and based on the latest survey of the infilled waste body (December 2023), there is 209,411 m^3 of this capacity remaining. Therefore, the total landfill capacity (existing and proposed) is 7,459,411m^3.

Table 2: Proposed waste quantities for acceptance at the Drehid WMF

Facility Infrastructure	Waste Type/Source	Maximum Incoming (TPA)	Of Which		Life of Facility
			Disposal to Landfill (TPA)	Recycling, Recovery or Process Losses (TPA)	
Extension to existing Landfill with intake increased from 120,000 TPA to 250,000 TPA	Non-hazardous household, commercial & industrial and C&D wastes	320,000	250,000	-	25 Years
New Processing & Recovery Facility (70,000 TPA)	Inert soil & stones and C&D Waste (Rubble)		-	70,000 Recovery – remains onsite for use as Engineering & Construction Material	25 Years
Existing Composting Facility increased from 25,000 to 35,000 TPA	Non-hazardous MSW and Other Organic Waste	90,000	40,000 Rejects and Biostabilised Compost Like Output	30,000 Process Losses	Unrestricted

[2] https://www.epa.ie/our-services/monitoring--assessment/waste/national-waste-statistics/municipal/ (EPA website accessed on 4th Sept 2023)

Facility Infrastructure	Waste Type/Source	Maximum Incoming (TPA)	Of Which		Life of Facility
			Disposal to Landfill (TPA)	Recycling, Recovery or Process Losses (TPA)	
New MSW Processing & Composting Facility (55,000 TPA) as an extension to existing Composting Facility				20,000 Recyclables and RDF/SRF[1] - Outgoing	
Contingency Capacity (30,000 TPA) – Landfill Disposal as requested by RWMPO	Non-hazardous household, commercial & industrial and C&D wastes	30,000	30,000		25 Years
Total		**440,000**	**320,000**	**120,000**	

[1] RDF = Refuse Derived Fuel; SRF = Solid Recovered Fuel

In accordance with the planning application submitted for additional landfill infrastructure, it is proposed that the maximum quantity of waste to be accepted for disposal to the landfill will be 320,000 TPA, which includes a contingency capacity of 30,000 per annum. It is proposed to increase the acceptance of Non-hazardous household, commercial & industrial and C&D wastes waste from 120,000 to 250,000 TPA.

D08 Biological treatment not specified elsewhere in this Annex which results in final compounds or mixtures which are discarded by means of any of the operations numbered D 1 to D 12 / R03 - Recycling/Reclamation of organic substances (including composting)

Table 3: R03 Capacity Calculations

Capacity	tonnes/day	Details
Existing Compost Facility	117	Average capacity of the plant allowing for annual intake of 35,000 tonnes of biodegradable material @ 6 days per week, 50 weeks per year.
MSW Processing & Composting Facility	183	Average capacity of the plant allowing for additional annual intake of 55,000 tonnes of materials @ 6 days per week, 50 weeks per year.
TOTAL	**300**	

The plant is designed to accept all organic, all unprocessed MSW or a combination of both. It is anticipated that it will accept 35,000 tonnes of organic waste and 55,000 tonnes of unprocessed organic waste.

The compost facility will be extended as part of the MSW Processing and Composting Facility, which will allow for the flexibility to accept up to 90,000 TPA of suitable biodegradable waste. The facility has the capacity to process 300 tonnes/day of suitable material.

The existing composting plant provides important infrastructure and treatment facilities for the management of organic waste materials and helps to reduce the biodegradable content of residual MSW prior to landfilling in accordance with the requirements of the Landfill Directive (1999/31/EC). The provision of organic waste treatment facilities such as the existing composting facility at Drehid has contributed towards Ireland achieving the target set out in the Landfill Directive.

The proposed extension of the existing composting facility and increasing the capacity of the plant (for the MSW Processing and Composting Facility) from 25,000 TPA to 90,000 TPA, will further contribute to reducing the quantities of biodegradable waste going to landfill. As outlined in Section 2.2.1 of the EIAR, the justification for the proposed changes to the volume of waste to be accepted at the composting facility is the ongoing requirement to divert bio-waste from landfill, as provided for in E.U. and National policy, and is supported by the recently adopted Eastern Midlands Regional Waste Management Plan, in which Policy E.17 states that *"The waste plan supports the development of at least 75,000 tonnes of additional biological treatment capacity in the region for the treatment of bio-wastes (food waste and green waste) primarily from the region to ensure there is adequate active and competitive treatment in the market."*

The national roll-out of brown bins for biodegradable waste is also expected to increase the quantity of biostabilised waste which is generated in the market, and which may require landfilling. The Government's Waste Action Plan for a Circular Economy (2020) states that "The EPA has estimated that correct use of the three household bins could reduce the volume of the general waste bin [MSW] by a third, and that municipal recycling (including organic waste for composting and anaerobic digestion through the organic bin) rate could increase by 50% (from 40%)". These measures, once implemented, may take a number of years to take effect and will result in slight changes in the above breakdown. Section 4.2 of the EIAR presents projections in future waste generation rates based on data from the EPA and the RWMPO's as well as European-wide changes in waste generation and management trends. These projected trends in the waste market will influence the exact make-up of individual waste types being placed into the new landfill over its 25-year operational lifetime.

Table 4: R03 Maximum Quantity Calculations

Maximum Quantity	TPA	Details
Increased Existing Compost Facility Capacity	35,000	Additional capacity available in existing facility
Composting Facility Extension	55 ,000	Proposed new facility

Maximum Quantity	TPA	Details
Existing Compost Facility	25,000	Existing capacity
TOTAL	**90,000**	

The compost facility will be extended to allow for the acceptance of up to 90,000 TPA of suitable biodegradable waste.

Clause 3 and Schedule 1 of the *Waste Management (Food Waste) Regulations 2009* do not apply to the Drehid WMF in respect of the generation of food waste. Nonetheless, any food waste generated by employees at the facility is segregated from recyclable materials and residual waste and stored separately. When full, waste containers are transferred to the composting facility.

R04 - Recycling/reclamation of metals and metal compounds

Table 5: R04 Capacity Calculations

Capacity	tonnes/day	Details
Metal and Plastics Recovery	8.33	2,500 - This material will be recovered from the incoming MSW waste which will be processed to remove recyclables.
TOTAL	**8.33**	

The MSW Processing and Composting Facility within the Drehid Facility will have the capacity to remove metals and plastics from incoming MSW.

MSW Processing - following the initial tunnel drying process, the material is fed by a loading shovel to the buffering and dosing hopper feeding the refining line. The hopper feeds the material to a belt conveyor which transfers it to a screener (for example a trommel screen or a star screen). The conveying line is also equipped with a magnetic separator for the removal of ferrous metals which are taken off-site to a suitably licensed recycling facility. This line will also remove plastics from the waste stream. The remaining oversize material of approximately 61.2 tonnes/day will be recovered from the waste stream as RDF or SRF feed material and exported offsite. The remaining undersize material / fine fractions will then be composed and ultimately disposed in the landfill.

The MSW proposed for intake will typically be direct from black bin waste and is likely to contain a high degree of recyclable materials, such as plastics and metals, as well as biodegradable materials.

Ferrous & non-ferrous metals and plastics will be stored separately and bulked up in dedicated bays for transfer off-site to suitable waste facilities for further processing. Steps in the treatment of incoming MSW will ensure there is maximum recovery of metal and plastic recyclable materials from the incoming waste stream.

R05 - Recycling/reclamation of other inorganic materials

Inorganic materials recycling or reclamation (to end-of-waste) (e.g. soil cleaning resulting in recovery of the soil and recycling of inorganic construction materials)

Table 6: R05 Capacity Calculations

Capacity	tonnes/day	Details
Recovered inert waste for engineering purposes	233	Recovery of up to 70,0000 TPA of inert soil & stones and C&D waste (rubble) as engineering materials for use in temporary roads, turning areas, tipping areas, daily/temporary cover and final capping in and on the landfill. 6 days/week, 50 weeks per year.
TOTAL	**233**	

Materials such as C&D fines, C&D rubble and non-hazardous soils and stones are all currently landfilled at the facility in accordance with the existing IE Licence and this proposal is for a continuation to accept the same types of materials at the new landfill.

Only inert waste such as greenfield soils can be used outside the liner for engineering purposes / final capping. The use of this waste material for engineering purposes avoids the import of virgin non-waste quarried aggregates and therefore the use of this waste material for this purpose is considered a recovery activity, as opposed to a disposal activity. This is in accordance with the requirements of Conditions 2.2.2.2 and 11.12 of the current IE Licence (Reg. No. W0201-03) and would be anticipated to be required in any IE Licence review for the facility issued by the EPA.

The operation of the MSW Landfill requires the laying of temporary haul roads, turning areas and tipping areas on the landfill waste body to allow incoming trucks to access the active tipping face. In addition, engineering materials are required for use as daily and intermediate cover. 143m^3/day of daily engineering material requirements for the MSW Landfill have been determined from current operations (50,000/50/5=200 TPA, approx. 143m^3/day)

A portion of this requirement can be fulfilled by the biostabilised compost facility output which is mainly used in intermediate and daily cover. However, the compost facility output is not suitable for construction

of haul roads and turning areas for HGVs on the waste body and therefore it is required to import suitable engineered material for recovery including C&D wastes, soil and glass.

Suitable material placed on top of the final cap plastic liner are considered engineering materials for landfill construction purposes and are not included in the above calculation of engineering materials for operational purposes.

Table 7: R05 Maximum Quantity Calculations

Maximum Quantity	TPA	Details
Engineering materials for use in landfill	70,000	Maximum quantity of Inert soil & stones and C&D Waste (Rubble) to be accepted at the facility (currently unlimited)
TOTAL	**70,000**	

As above, approval is being sought for the import of 70,000 TPA of Inert soil & stones and C&D Waste (Rubble) for operational purposes at the Drehid WMF.

R11 - Use of waste obtained from any of the operations numbered R 1 to R 10

The material proposed for use within or on the landfill cap will be stored on the landfill site. Recovered stone intended for road construction (outside the lined landfill) will be stored either along the perimeter road around the proposed landfill or within the Contractors Compound. The maximum quantity of recovered waste to be stored for these purposes will be 30,000 tonnes. This estimate is based on current engineering material requirements at the existing facility.

Table 8: Maximum Capacity Calculations

Capacity	Tonnes/day	Details
Temporary storage of inert engineering materials for use in landfills	100	30,000 Recovery – remains onsite for use as Engineering & Construction Material
TOTAL	**100**	

R12 - Exchange of waste for submission to any of the operations numbered R 1 to R 11 - Production of fuel from waste including SRF and RDF

The proposed new MSW Processing and Composting Facility will allow for the acceptance of untreated MSW which will be screened to remove recyclable materials and undersize material (typically <60 mm diameter). The remaining oversize material will comprise a refuse derived fuel (RDF) or feed material to

produce solid recovered fuel (SRF) product which will then be exported from the Drehid WMF along with the recycled materials for further processing off-site.

Capacity	Tonnes/day	Details
Production of fuel - RDF	58.33	17,500 TPA of RDF temporarily stored on site for export @ 6 days per week 50 weeks per year
TOTAL	**58.33**	

The MSW processing plant will include for the detection and segregation of plastics and metals from the incoming waste stream which will be stored in dedicated bays and baled/packaged for removal off-site for further processing. The remaining oversize material (>60 mm) will be diverted to dedicated storage bays to be bulked up and removed off-site as RDF or for further processing into SRF products. These products can then be utilised in Waste-to-Energy plants, co-firing in approved cement kilns or exported for treatment abroad. The quantity of output (recyclable and recovered material) from the MSW processing activity which will be removed from the Drehid WMF will be approx. 20,000 TPA. These output materials will be transferred off-site in bulk haulage vehicles to approved waste facilities located in the GDA.