

## **Attachment-4-3-2-Landfill Emissions and Controls (Supporting Information)**

### **Attachment L.1:**

Details of the site selection for the landfills is outlined in Chapter 4 (Alternatives) of the Existing Facility EIAR (MSW Landfill) and Proposed Development EIAR (Non-Hazardous and Hazardous Landfill).

A location map for the facility is included in Section 3 of the online application form. In addition, site location maps illustrating the background regional geology and hydrogeology are presented in Chapters 6 and 7 of the EIAR's.

An Operational Report is included as Attachment 4-8-1.

Details of the basal liner containment and gas and leachate management for the landfills is outlined in Chapter 3 (Description of the Development) of the Existing Facility EIAR (MSW Landfill) and Proposed Development EIAR (Non-Hazardous and Hazardous Landfill).

Details of the post-closure care of the facility are presented in the Closure, Restoration and Aftercare Management Plan (CRAMP) included as Attachment-9-2-3.

### **Attachment L.2:**

Full details of the basal liner for the landfills is provided in Section 3.5 of the EIARs.

Landfill construction gradients are specified on the drawings included as Volume III to the EIARs.

### **Attachment L.3:**

Leachate monitoring in the landfill waste body will be carried out on a continuous basis by the use of hydrostatic sensors located in the leachate collection sumps which is connected to a SCADA system. The leachate collection system layout for the proposed non-hazardous and hazardous landfills is shown on Drawing No. 8108-2013. The hydrostatic sensors located in the leachate collection sumps.

Leachate monitoring will be carried out on a continuous basis in the leachate treatment facility by the SCADA system to ensure optimal treatment conditions in the aeration tank, anoxic tank and post anoxic tank. Sampling and testing of leachate quality will take place as required with Irish Water to confirm the leachate quality being removed from site for disposal at municipal wastewater treatment plants.

Leachate generated from the hazardous landfill will be collected for reuse in the ash solidification process and will be subject to monitoring and testing as part of the batching process.

#### **Attachment L.4:**

Details on landfill gas management are provided in Section 3.7 of the Existing Facility EIAR. The landfill gas management system which includes controlled flaring and utilisation plant for conversion of the gas to electricity, is currently in operation at the facility.

The landfill gas management will capture and treat gas from the MSW and Non-Hazardous Landfill. It is not proposed to install gas collection infrastructure in the Hazardous Landfill. This approach is in compliance with the approach adopted at existing landfills in Europe that accept inert hazardous waste, similar in nature to the proposed development.

The volume of landfill gas generated at the existing MSW Landfill in 2017 was estimated using predictive gas generation model GasSim Version 1.54. The model estimates that approximately 3,089 m<sup>3</sup>/hr of landfill gas is produced in the MSW Landfill which equates to 27,059,640 m<sup>3</sup>/year based on a 24/7 operation. The MSW Landfill will only remain operational until 2028 after which the landfill will cease accepting waste.

Table L.4 (ii) in the Attachment-4-3-2 template provides representative monitoring results from the landfill gas flares (F1) and the landfill gas utilisation plant (E4).

#### **Attachment L.5:**

Details on the landfill capping system are provided in Section 3.4.1 of the EIARs and a typical section of the capping is shown on Drawing No. S108-2063.

The EIARs outline the requirements for the preparation of Method Statements and Quality Control Procedures during the landfill construction. The Method Statements will be prepared as required by the Contractor prior to commencement of the works. The Engineer will detail the Quality Control procedures as part of the landfill construction tender process.

#### **Attachment L.6:**

As is currently at place at the Drehid WMF, a weather station is erected adjacent to the administrative building which measures precipitation, minimum temperature, maximum temperature and atmospheric pressure, on a daily basis. This weather station will be retained for the duration of operations at the Drehid WMF.

In addition, for the purposes of reporting data for the facility AERs, average rainfall and temperature data is obtained from the meteorological station at Casement Aerodrome which is located approx. 40 km from the facility.

#### Attachment L.7:

The costs in the setting up, operation of, and provision of financial security and closure and after-care, for a period of at least 30 years, are covered by the price charged for the disposal of waste at the facility.

The Drehid WMF is required to submit a Section 53A Statement annually in line with a legal requirement under Section 53A of the Waste Management Act 1996 (as amended) and Condition 12.4 of the existing IED License (W0201-03). This is completed by Bord na Móna Plc. at the end of its financial year which (in 2018) is the end of March 2018. Following the finalisation of its financial year end accounts, Bord na Móna submit a S53A statement to the Agency via Eden.

In line with the above ongoing practice, Bord na Móna will duly oblige with the requirement to submit a S53A Statement to the Agency upon granting of a new IED Licence.

#### Attachment L.8:

Details of the phasing for the existing MSW Landfill are provided in Sections 3.2.1.1 and 3.2.1.2 of the Existing Facility EIAR. These sections outlined the current completed landfilling details as well as the estimated future landfilling activities.

Details of the proposed phasing of the Non-Hazardous and Hazardous Landfills are presented in Section 3.4.1 of the Proposed Development EIAR. The phasing of the proposed landfill infrastructure is also shown on Drawing No.'s 8108-2011 and 8108-2012.

#### Attachment L.9:

The estimated material balance for the construction of the Non-Hazardous and Hazardous Landfills is set out in Tables 3.25 and 3.26 of the Proposed Development EIAR.

The estimated material balance for construction of the remaining phases of the MSW Landfill (i.e. Phase 14 and 15) is set out in Table L.9.1 below. The material requirements for permanent capping apply to Phases 5 to 15 of the MSW Landfill.

**Table L.9.1: Estimated Material Balance for MSW Landfill**

Item	Material	Quantity	Source
Material for bund construction (Phase 15 only)	Compacted suitable subsoil materials	13,364 m <sup>3</sup>	Won on-site
Low Permeability Basal Layer	Bentonite Enhanced Soil - BES; Bentonite (Bentonite is 5% of volume of BES)	1,056 m <sup>3</sup>	Import

	Bentonite Enhanced Soil - BES; Sand	20,064 m <sup>3</sup>	Import
Basal Geomembrane Liner	Flexible HDPE geomembrane liner (2.0mm).	42,240 m <sup>2</sup>	Import
Protection Layer	Layer of woven Geotextile (750g/m <sup>2</sup> ) or similar	42,240 m <sup>2</sup>	Import
Basal Drainage Layer	Granular Material e.g. Clause 505B (500mm)	16,122 m <sup>3</sup>	Import
Daily Cover (Phase 13, 14 & 15)	Hessian rolls or similar	50,760 m <sup>2</sup>	Import
Temporary Cover (Phase 13, 14 & 15)	Low permeability clay (300mm)	21,801 m <sup>3</sup>	Won on-site
Gas Drainage Layer (Phases 5-15)	Geosynthetic Gas Drainage Layer e.g. EnkaDrain or similar	266,468 m <sup>2</sup>	Import
Capping Geomembrane Liner (Phases 5-15)	Flexible LLDPE geomembrane liner (2.0mm) or Geosynthetic Clay Liner (GCL) or similar.	269,280 m <sup>2</sup>	Import
Capping - Low Permeability Layer (Phases 5-15)	Clay 300mm thick Layer	53,295 m <sup>2</sup>	Import
Protection Layer	Layer of woven Geotextile (750g/m <sup>2</sup> ) or similar	48,960 m <sup>2</sup>	Import
Capping Drainage Layer (Phases 5-15)	Granular Material e.g. Clause 505 (300mm) or similar including reprocessed C&D material	79,939 m <sup>3</sup>	Import
Capping Subsoil (Phases 5-15)	Subsoil (850 mm)	226,499 m <sup>3</sup>	Won on-site
Capping Topsoil (Phases 5-15)	Topsoil (150 mm)	39,970 m <sup>3</sup>	Won on-site

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