Matrix Environmental

BIOFILTER MONITORING AT THE MILLTOWN COMPOST SITE, MILLTOWNMORE, FETHARD, CO. TIPPERARY. 2021 W0270-02

For the Attention of:

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Ref: Biofilter Monitoring 2021

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Executive Summary

Milltown Compost facility commissioned Matrix Environmental to undertake inlet and outlet sampling and analysis of the biofilters at their facility at Milltownmore, County Tipperary as per the requirements of their waste licence W0270-02. This included testing of the biofilter media for pH, Ammonia, Percent Moisture and Total Viable Counts (TVC's) and testing the inlet and outlet gases of the biofilters for Ammonia, Hydrogen Sulphide, Amines and Mercaptans. An Environmental Consultant subsequently visited the site on the 16th of June 2021 and the 21st of September 2021 to undertake the Bi-Annual biofilter media sampling and the gas analysis. The bi-monthly sampling and analysis was carried out by Miltown Composting staff.

The results of the biofilter media monitoring are outlined in section 4.0. The results of the emission monitoring are also given in section 4.0. The outlet emission levels were compared to typical emission limit values for comparable facilities. All results are within the typical licence limits.

This report is certified as accurate and representative of the sampling and associated analysis carried out.

1.0 INTRODUCTION

In compliance with the requirements of their waste licence (W0270-02) Milltown Compost are required to carry out monitoring of the inlet and outlet airstream of their biofilter and also the biofilter media itself.

An Environmental Consultant subsequently visited the site on the 16th of June 2021 and the 21st of September 2021 to undertake the Bi-Annual biofilter media sampling and the gas analysis. The bi-monthly sampling and analysis was carried out by Miltown Composting staff.

This report presents details of the sampling and analytical methodology carried out together with a broad interpretation of the results.

2.0 SCOPE OF MONITORING

The monitoring scope is outlined in Tables 2.1 and 2.2 below.

Table 2.1 Scope of Bed monitoring		
Parameters	**Location**	**Frequency**
pH, Moisture, TVC's, Ammonia	Biofilter Surface	Bi-Annual
Moisture Content	Biofilter Surface	Bi-Monthly

Table 2.2 Scope of inlet and outlet monitoring		
Parameters	**Location**	
Ammonia, Mercaptans Hydrogen Sulphide, Amines	Biofilter inlet duct x 2	Bi-Monthly
Ammonia, Mercaptans Hydrogen Sulphide, Amines, Negative Pressure	Biofilter surface	Bi-Monthly

3.0 METHODOLOGY

3.1 Biofilter bed sampling

Table 3.1: Parameters and Limits of Detection

Parameter	Method of Analysis	Volume Required
Moisture Content	P274	100 g
pH_W (soils)	P233	20g
Ammonia	P236	100g
TVC's @ 30°C	SP48 Based on ISO 4833-1: 2013	250g

3.2 Biofilter emission sampling

Levels of the required parameters were determined colorimetrically using the appropriate Draeger tube and pump. Each analysis was carried out by placing the tube into the pump and pulling a known volume through the tube. The appearance of a discoloration indicates the presence of the species of interest. The results are expressed in ppm. The results for Amines are described as positive or negative

Milltown Compost site personnel confirmed that the biofilter was operating as normal on the day of sampling.

4.0 RESULTS

Biannual Results from Matrix Environmental

16th of June 2021

Table 4.1 presents the results of the Biofilter Media analysis

Table 4.1 Monitoring results from the Biofilter media		
Parameter	**Result Biofilter 1**	**Result Biofilter 2**
% Moisture	72.34	77.2
pH	5.5	5.9
Ammonia (mg/kg)	6.15	8.39
Total Viable Counts @ 30ºC (Solid) cfu/g	520000	1300000

Table 4.2 Inlet emission levels of required parameters Biofilter 1		
Parameter	**Inlet 1 Concentration (ppm)**	**Inlet 2 Concentration (ppm)**
Hydrogen Sulphide	<0.2	<0.2
Ammonia	20	15
Mercaptans	0.5	<0.5
Amines	Present	Present

Table 4.3 Inlet emission levels of required parameters Biofilter 2		
Parameter	**Inlet 1 Concentration (ppm)**	**Inlet 2 Concentration (ppm)**
Hydrogen Sulphide	<0.2	<0.2
Ammonia	20	20
Mercaptans	0.5	<0.5
Amines	Present	Present

Table 4.4 Outlet emission levels of required parameters		
Parameter	**Result Biofilter 1**	**Result Biofilter 2**
Hydrogen Sulphide	<0.2	<0.2
Ammonia	<5	<5
Mercaptans	<0.5	<0.5
Amines	Negative	Negative
Negative Pressure (Smoke test)	Positive Pressure	Positive Pressure

21st of September 2021

Table 4.1 presents the results of the Biofilter Media analysis

Table 4.1 Monitoring results from the Biofilter media		
Parameter	**Result Biofilter 1**	**Result Biofilter 2**
% Moisture	50.27	55.69
pH	5.6	6.1
Ammonia (mg/kg)	9.93	2.05
Total Viable Counts @ 30ºC (Solid) cfu/g	1200000	810000

Table 4.2 Inlet emission levels of required parameters Biofilter 1		
Parameter	**Inlet 1 Concentration (ppm)**	**Inlet 2 Concentration (ppm)**
Hydrogen Sulphide	<0.2	<0.2
Ammonia	15	20
Mercaptans	0.5	<0.5
Amines	Present	Present

Table 4.3 Inlet emission levels of required parameters Biofilter 2		
Parameter	**Inlet 1 Concentration (ppm)**	**Inlet 2 Concentration (ppm)**
Hydrogen Sulphide	<0.2	<0.2
Ammonia	15	25
Mercaptans	0.5	<0.5
Amines	Present	Present

Table 4.4 Outlet emission levels of required parameters		
Parameter	**Result Biofilter 1**	**Result Biofilter 2**
Hydrogen Sulphide	<0.2	<0.2
Ammonia	<5	<5
Mercaptans	<0.5	<0.5
Amines	Negative	Negative
Negative Pressure (Smoke test)	Positive Pressure	Positive Pressure

Bi-Monthly Results from Miltown Compost Monitoring

Date: Feb 2021	Monthly Biofilter Check Results (PPM)				
Location	Ammonia	Hydrogen Sulphide	Mercaptens	Amines	Negative Pressure Test
Biofilter 1 Inlet A	10	0	0	Present	
Biofilter 1 Inlet B	15	0	0	Present	
Biofilter 1 Outlet	0	0	0	Absent	Positive
Biofilter 2 Inlet A	25	0	0	Present	
Biofilter 2 Inlet B	35	0	0	Present	
Biofilter 2 Outlet	0	0	0	Absent	Positive

Date: April 2021	Monthly Biofilter Check Results (PPM)				
Location	Ammonia	Hydrogen Sulphide	Mercaptens	Amines	Negative Pressure Test
Biofilter 1 Inlet A	10	0	0	Present	
Biofilter 1 Inlet B	20	0	0	Present	
Biofilter 1 Outlet	0	0	0	Absent	Positive
Biofilter 2 Inlet A	35	0	0	Present	
Biofilter 2 Inlet B	15	0	0	Present	
Biofilter 2 Outlet	0	0	0	Absent	Positive

Date: Oct 2021	Monthly Biofilter Check Results (PPM)				
Location	Ammonia	Hydrogen Sulphide	Mercaptens	Amines	Negative Pressure Test
Biofilter 1 Inlet A	10	0	0	Present	
Biofilter 1 Inlet B	20	0	0	Present	
Biofilter 1 Outlet	0	0	0	Absent	Positive
Biofilter 2 Inlet A	35	0	0	Present	
Biofilter 2 Inlet B	15	0	0	Present	
Biofilter 2 Outlet	0	0	0	Absent	Positive

Date: Dec 2021	Monthly Biofilter Check Results (PPM)				
Location	Ammonia	Hydrogen Sulphide	Mercaptens	Amines	Negative Pressure Test
Biofilter 1 Inlet A	10	0	0	Present	
Biofilter 1 Inlet B	15	0	0	Present	
Biofilter 1 Outlet	0	0	0	Absent	Positive
Biofilter 2 Inlet A	40	0	0	Present	
Biofilter 2 Inlet B	20	0	0	Present	
Biofilter 2 Outlet	0	0	0	Absent	Positive

Table 4.4 Moisture Content Biofilter Bed Results - Monthly		
Date	**Result Biofilter 1**	**Result Biofilter 2**
25/2/21	76.74%	73.84%
29/4/21	71.65%	58.38%
29/9/21	79.50%	79.63%
3/11/21	77.24%	78.76%

5.0 COMMENT

There are no specific limits detailed in the sites waste licence, however typical limits for biofilter emissions are detailed below.

- Ammonia – 50ppm
- Mercaptan – 5ppm
- Hydrogen Sulphide – 5ppm

The biofilter emission levels at the Milltown compost facility are within these typical limit values.

The results obtained reflect the conditions on the day of sampling and current site operations on that day.