

Eve O'Sullivan

Subject: FW: Kingscourt Landfill
Attachments: CCC-08-01-03-GAS-Rev 0.pdf; CCC-08-01-03-GAS-Rev 0 (002).pdf; Gas Monitoring.xlsx

From: Brona Keating <bkeating@cavancoco.ie>
Sent: 05 November 2019 15:21
To: Ewa Babiarczyk <E.Babiarczyk@epa.ie>
Cc: Sean Guider <sguider@cavancoco.ie>
Subject: Kingscourt Landfill

Hi Ewa

Attached please find the most recent landfill gas monitoring results for Kingscourt landfill 2017-2019. Please note that there are no waterbodies in the vicinity of this site.

Should you require any additional information please dont hesitate to contact me.

Regards

Bróna Keating
Cavan County Council

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Method	GA5000						
Parameter	CH4	CO2	O2	CO	H2S	Pressure	Balance
Units	% v/v	% v/v	%	%	PPM	mb	%
Date of Test	17.10.19						
MW1	1.1	0.6	19.9	0	0	-0.02	78.4
MW2	1.1	1.7	18	0	0	-0.02	79.2
MW3	1	0.2	20.3	0	0	-0.02	78.5
MW4	1.1	0.1	20.5	0	0	-0.05	78.3
MW5	1	0.1	20.6	0	0	-0.02	78.2
MW6	1.1	0.1	20.6	0	0	-0.02	78.2

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GAS MONITORING REPORT KINGSCOURT LANDFILL 2017

Document No.: CCC-08-01-03-Rev 0

Project No.: CCC-08-01-03

Client: Cavan County Council

Project Name: Kingscourt Landfill
Dunaree,
Co. Cavan

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Summary of Document Revisions		
Rev No.	Date Revised	Revision Description

Prepared by	Terry Keating	22/03/18
Approved by	Gareth O'Brien	23/03/18

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1 SUMMARY

Boylan Engineering (Eng. & Environmental Consultancy) was commissioned by Cavan County Council to carry out environmental monitoring at Kingscourt Landfill, Dunaree, Co Cavan. This report documents the finding from the gas monitoring undertaken at Kingscourt Landfill on 14th December 2017.

2 INTRODUCTION

Kingscourt landfill is situated approximately 0.55 kilometre from Kingscourt town centre in the townland of Dunaree. The site comprises an area of approximately 1.16 hectares. A review of historic OSI maps (1837-1842 / 1888-1913) indicates that the site was historically a quarry which was subsequently infilled. Boylan Engineering has not been provided with any Information pertaining to the operation lifetime of the landfill.

The following report give details of the landfill gas monitoring conducted on site on 14th December 2017.

- The purpose of environmental monitoring at closed landfills is to:
- Ensure the facility is compliant with the waste license (if applicable)
- Ensure the facility is not causing environmental pollution
- Ensure the facility is not posing a risk to human health
- Ensure the facility is not creating an unacceptable risk to atmosphere, water, soil, plants or animals
- Ensure the facility is not adversely affecting the countryside or places of interest
- Compare actual site behaviour with expected modelled behaviour
- Establish a reliable database of information for the landfill throughout its life

According to the Response matrix for landfills, Kingscourt landfill is situated in the R2² Zone. This zone was categorized using a vulnerability rating combined with the aquifer category for the area. Landfills situated in R2² Zones are acceptable subject to guidance in the EPA Landfill Design Manual or conditions of a waste licence - (EPA, groundwater protection responses for Landfills). Unfortunately this landfill was constructed prior to this guidance and conditions were issued only after its closure.

3 METHODOLOGY

3.1 Environmental Monitoring and Sampling

The following procedure were conducted by Boylan Engineering to ensure accurate gas monitoring:

- EPA, Landfill Manual, landfill monitoring 2nd Edition was adhered to.
- GA 2000 landfill gas analyser was used to measure the gas levels.
- The analyser is purged and connected to the sealed well monitoring nozzle.
- The monitoring nozzle is turned to the open position and the analyser measured the gas levels at 60 second intervals for no less than 5 minutes. The analyser is allowed to run for this period of time to allow for a representative average to be obtained.
- All data is recorded on the Gas Analysis field sheets.
- The instrument is removed after 5 minutes and the monitoring nozzle returned to the closed position.
- The GA2000 is switched off between each monitoring location so as to allow the instrument to purge.
- This process is repeated at each monitoring location.
- Data for the GA 2000 was downloaded in the Boylan Engineering office

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3.2 Weather Report

The weather report from 14th December 2017 is presented in the table below.

Table 1 – Weather Report for 14th of December 2017

REPORTS FROM BALLYHAISE (A)							
Date	Rainfall	Max	Min	Grass Min Temp	Mean Wind Speed	Maximum Gust	Sunshine
	(mm)	Temp	Temp	(°C)	(knots)	(if >= 34 knots)	(hours)
		(°C)	(°C)				
14/12/2017	10.4	5.6	1	-0.4	9.3		

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3.3 Monitoring Locations

The gas monitoring locations for December 14th 2017 are presented in the Figure 1 below.

Figure 1 – Gas monitoring locations



4 SUMMARY OF RESULTS

A summary of the gas monitoring results from December 2017 is presented in Table 2 below. The results have been assessed against the limits specified for EPA licenced sites, however, as noted the site is not licenced by the EPA.

Table 2 – Summary of December Gas Monitoring Analytical Results

Method	GA 2000	GA 2000	GA 2000	GA 2000	GA 2000		
Parameter	CH ₄	CO ₂	O ₂	H ₂ S	Barometric Pressure	Position to waste mass	
Units	% v/v	% v/v	%	PPM	mb		
Date Testing	14/12/2017						
GA 2000 Ref	Client Ref						
1	MW 2	0.06	12.36	12.2	0	970	Inside
2	MW 1	0.05	4	16.84	0	970	Inside
3	MW 4	0.05	7.3	17.96	0	970	Inside
4	MW 3	0.04	13.3	11.6	0.0	970.0	Inside
	Limit	1	1.5				

Exceedance, outside waste mass

NOTES

- 1 Instrument Serial No: GA 07727
- 2 Limit: Schedule C2, Licence

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5 DISCUSSION OF RESULTS

5.1 Discussion of Results

The rate of gas generation at a landfill site varies through the life of a landfill and is dependent on several factors such as waste type, depths, moisture content, degree of compaction, landfill pH, temperature and the length of time since the waste was deposited. Landfill gas can move in any direction within the waste body and migrate from a site. The potential for gas migration will depend on the gas quality, volume, the site engineering works, geological characteristics of the surrounding strata and on man-made pathways such as sewers and drains.

The methane content of landfill gas is flammable, forming potentially explosive mixtures in certain conditions, which raises concern about its uncontrolled migration and release, while elevated carbon dioxide levels can be an asphyxiation risk.

The results from the monitoring undertaken on 14th December 2017 are presented in Table 2 in Section 4. These results have been compared to limits specified for EPA licensed landfills, however, as noted the landfill is not licenced by the EPA. Any exceedance is highlighted in bold italic.

A review of the gas monitoring data indicates that the levels of gas are within the waste licence limits stipulated for similar landfills of relative nature and size. A very low concentration for methane was detected across the site, ranging from 0.04 to 0.06 % v/v, with the highest concentration recorded at MW2. The results for carbon dioxide ranged from 4 to 13.3 % v/v, with the highest concentration recorded at MW3.

It should be noted that the monitoring plan presented in Figure 1 outlines that MW4 may be located inside the waste mass. Monitoring at this location returned a concentration of 7.3 % v/v, however, a review of historic OSI maps indicate that this area is located within the quarry site and therefore infilling may have occurred here also.

This round of monitoring was requested by Cavan County Council as a once off event.

6 CONCLUSION

The results from landfill gas analysis at Kingscourt Landfill does not indicate any signs of dramatic readings for methane and carbon dioxide therefore there is no evidence of any major negative environmental impact associated with gas generation at the landfill. The level of methane recorded at the landfill are very low with the maximum concentration recorded at 0.06 %v/v, while the highest concentration for carbon dioxide was recorded at 13.3 %v/v.

GAS MONITORING REPORT KINGSCOURT LANDFILL 2018

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Dunaree,
Co. Cavan

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Summary of Document Revisions		
Rev No.	Date Revised	Revision Description

Prepared by	John Halton	13/12/18
Approved by	Brian Cooney	13/12/18

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1 SUMMARY

Boylan Engineering (Eng. & Environmental Consultancy) was commissioned by Cavan County Council to carry out environmental monitoring at Kingscourt Landfill, Dunaree, Co Cavan. This report documents the finding from the gas monitoring undertaken at Kingscourt Landfill on 11th October 2018.

2 INTRODUCTION

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The following report give details of the landfill gas monitoring conducted on site on 11th October 2018.

- The purpose of environmental monitoring at closed landfills is to:
- Ensure the facility is compliant with the waste license (if applicable)
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- Ensure the facility is not posing a risk to human health
- Ensure the facility is not creating an unacceptable risk to atmosphere, water, soil, plants or animals
- Ensure the facility is not adversely affecting the countryside or places of interest
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According to the Response matrix for landfills, Kingscourt landfill is situated in the R2² Zone. This zone was categorized using a vulnerability rating combined with the aquifer category for the area. Landfills situated in R2² Zones are acceptable subject to guidance in the EPA Landfill Design Manual or conditions of a waste licence - (EPA, groundwater protection responses for Landfills). Unfortunately this landfill was constructed prior to this guidance and conditions were issued only after its closure.

3 METHODOLOGY

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- The GA2000 is switched off between each monitoring location so as to allow the instrument to purge.
- This process is repeated at each monitoring location.

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3.2 Weather Report

The weather report from 11th October 2018 is presented in the table below.

Table 1 – Weather Report for 11th October 2018

WEATHER STATION REPORTS FROM BALLYHAISE							
Date	Rainfall	Max Temp	Min Temp	Grass Min Temp	Mean Wind Speed	Max Gust	Sunshine
	(mm)	(°C)	(°C)	(°C)	(knots)	(>= 34 knots)	(hours)
11/10/2018	4.5	16.1	9.7	6.4	8.3	na	na

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3.3 Monitoring Locations

The gas monitoring locations for October 11th 2018 are presented in Figure 1 as shown below.

Figure 1 – Gas monitoring locations



4 SUMMARY OF RESULTS

A summary of the gas monitoring results from October 2018 is presented in Table 2 below. The results have been assessed against the limits specified for EPA licenced sites, however, as noted the site is not licenced by the EPA.

Table 2 – Summary of December Gas Monitoring Analytical Results

Method	GA 2000	GA 2000	GA 2000	GA 2000	GA 2000		
Parameter	CH ₄	CO ₂	O ₂	H ₂ S	Barometric Pressure	Position to waste mass	
Units	% v/v	% v/v	%	PPM	mb		
Date Testing	11/10/2018						
GA 2000 Ref	Client Ref						
na	MW 2	0.075	6.1	12.1	0	989	Inside
na	MW 1	0	1.3	18.92	0	989	Inside
na	MW 3	0	0.4	20.6	0	989	Inside
	Limit	1	1.5				

Exceedance

NOTES

- 1 Instrument Serial No: GA 07721
- 2 Limit: Schedule C2, Licence

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5 DISCUSSION OF RESULTS

5.1 Discussion of Results

The rate of gas generation at a landfill site varies through the life of a landfill and is dependent on several factors such as waste type, depths, moisture content, degree of compaction, landfill pH, temperature and the length of time since the waste was deposited. Landfill gas can move in any direction within the waste body and migrate from a site. The potential for gas migration will depend on the gas quality, volume, the site engineering works, geological characteristics of the surrounding strata and on man-made pathways such as sewers and drains.

The methane content of landfill gas is flammable, forming potentially explosive mixtures in certain conditions, which raises concern about its uncontrolled migration and release, while elevated carbon dioxide levels can be an asphyxiation risk.

The results from the monitoring undertaken on 11th October 2018 are presented in Table 2 in Section 4. These results have been compared to limits specified for EPA licensed landfills, however, as noted the landfill is not licenced by the EPA. Any exceedance is highlighted in bold italic.

A review of the gas monitoring data indicates that the levels of gas are within the waste licence limits stipulated for similar landfills of relative nature and size. A very low concentration for methane was detected across the site (0.075 % v/v), with the highest concentration recorded at MW2. The results for carbon dioxide ranged from 6.1 to 0.4% v/v, with the highest concentration recorded at MW2.

It should be noted that the monitoring plan presented in Figure 1 outlines that MW4 may be located inside the waste mass. MW4 could not be located during the monitoring event. A review of historic OSI maps indicate that this area is located within the quarry site and therefore infilling may have occurred here.

This round of monitoring was requested by Cavan County Council as a once off event.

6 CONCLUSION

The level of methane recorded at the landfill was very low with the maximum concentration of 0.075 %v/v recorded at MW2 while the highest concentration 6.1 %v/v. for carbon dioxide was recorded at MW2.