



**AN APPLICATION TO VARY ENVIRONMENTAL
PERMIT NO. RP3133PP FOR THE THORNHAUGH
LANDFILL SITE OPERATED BY AUGEAN SOUTH
LIMITED TO CHANGE THE RESTORATION PROFILE
OF THE EXISTING PERMITTED SITE**

LANDFILL GAS RISK ASSESSMENT

Report reference: AU/TH/LRM/5784/01/LFGRA
July 2025



Technical advisers on environmental issues

Baddesley Colliery Offices, Main Road, Baxterley, Atherstone, Warwickshire, CV9 2LE
Tel. (01827) 717891

CONTENTS

1.	Qualitative Landfill Gas Risk Assessment	1
2.	Landfill gas monitoring	4
3.	Conclusions	5

APPENDICES

Appendix LFGRA A Gas production and combustion curves from the 2014 LFGRA

This report has been prepared by MJCA with all reasonable skill, care and diligence, and taking account of the Services and the Terms agreed between MJCA and the Client. This report is confidential to the client and MJCA accepts no responsibility whatsoever to third parties to whom this report, or any part thereof, is made known, unless formally agreed by MJCA beforehand. Any such party relies upon the report at their own risk.

1. Qualitative Landfill Gas Risk Assessment

1.1 MJCA is commissioned by Augean South Limited (Augean) to prepare a Landfill Gas Risk Assessment (LFGRA) to support an application to vary Environmental Permit Number EPR/RP3133PP (the Permit) to change the restoration profile for the Thornhaugh Landfill Site (the site), Thornhaugh, Peterborough, PE8 6NS. The site is operated by Augean and is permitted for the deposition of non-hazardous commercial and industrial waste, gypsum and other high sulphate bearing wastes, stable non-reactive hazardous waste (SNRHW) and asbestos waste.

1.2 The LFGRA for the site was last formally submitted to the Environment Agency in September 2014 in support of the application for variation V006 of the permit which was issued by the Environment Agency on 4 May 2016.

1.3 The 2014 LFGRA concluded:

“The GasSim model predicts that the landfill gas generation rate at Thornhaugh Landfill will peak in 2014 at a rate of 109 m³/hr. It is considered that the landfill gas flare will be sufficient to control the gas at the maximum generation rate predicted by the model.”

“It is predicted that emissions from the surface of the landfill will peak in 2014 and that emissions from the flare will peak in 2015. The results of the Tier 1 screening assessment show that the current and future emissions from the surface of the landfill and from the flare will have no adverse environmental impact. As it is calculated that the emissions from the sidewalls of the landfill are negligible there is no risk of lateral migration of significant quantities of landfill gas to sensitive receptors or of vegetation stress.”

1.4 The 2014 LFGRA explains that the landfill gas generated at the site generally is generated in the older landfill phases at the site in which biodegradable wastes were deposited between 1984 and 2005 (hence between 20 and 40 years ago). The 2014 LFGRA included a review of waste returns data for the period 2006 to 2013, from which it was concluded that during this period there was a reduction in the receipt of waste types with the potential for the generation of landfill gas reflected by the increase in soil and treated soil wastes deposited at the site. A total bulk landfill gas

production curve and a total combusted landfill gas curve for the flare installed at the site were presented at Appendix LFGRA 4A of the 2014 LFGRA. Copies of these curves are presented at Appendix LFGRA A to this LFGRA. The total bulk landfill gas production curve predicted that landfill gas production would peak in 2014 and that combustion emissions would peak in 2015 at 48m³/h. It can be seen from the flare output curve presented at Appendix LRGRA A that the predicted quantity of landfill gas combusted in the flare in the year 2024 was approximately 33m³/h. The records of the measured flow rate of landfill gas through the flare for the period 2021 to 2024 are presented in the table below and are compared with the predicted gas combustion rate.

Year	Flow rate of landfill gas through the flare	
	Predicted in 2014 LGFRA m ³ /h	Measured/observed on site m ³ /h
2021	40	20
2022	38	22
2023	36	16
2024	34	20

The data in the table show that the actual recorded volume of gas combusted in the flare is considerably lower (up to 50% lower) than the gas flow predicted in the 2014 LFGRA hence the 2014 LFGRA comprises a conservative assessment of the emissions from the site.

- 1.6** A review of the waste returns for the site for the last 10 years (2014-2024) shows that over 99% of the waste received by the site over this period was recorded on the waste returns as non-biodegradable and over 99% of the waste was recorded on the waste returns as coming from a non-municipal source. Although a variety of waste types were accepted during this period, the largest volume of waste types accepted were soils and treated soils, ash and construction and insulation materials containing asbestos. For the purpose of assessing landfill gas generation, the wastes received over the last 10 years are treated as comprising inert materials having no significant gas generating potential.
- 1.7** The variation application is made in order to incorporate the changes to the consented restoration profile for the site as a result of the integration of the restoration proposals for the site with the former mineral extraction site at Cooks Hole Quarry immediately to the south of the site. As a result of the changes to the restoration profile, an additional depth of waste will be placed over some of the landfill area

compared with that currently consented. There are no changes to the types of wastes received at the site, the general principles of the site containment design, the principles of the site operations including leachate and landfill gas management and site monitoring. Landfill gas generated in the older part of the existing landfill will continue to be collected and flared. There are no changes to the boundary of the site. The variation will not add any additional activities to the Permit.

- 1.8** As the results of the 2014 LFGRA show that the calculated short term concentrations of the compounds modelled at the permit boundary and at the receptor nearest to the flare are insignificant and show that as the predicted long term concentrations of the compounds modelled are significantly below the Environmental Assessment Limits derived to protect human health and the environment, no detailed modelling of the long term impacts of emissions from the flare is necessary. The 2014 LFGRA predicted that the rate of total bulk landfill gas generated in 2024 would be approximately 55m³/h and that the quantity of landfill gas combusted in the flare would be approximately 34m³/h. Given that the quantity of landfill gas combusted in the flare in 2024 is significantly lower than the quantity predicted by the 2014 LFGRA and given that the waste types which will continue to be accepted at the site have no significant gas generating potential it is not necessary to update the LFGRA prepared in 2014 and the gas risk assessment prepared and submitted in support of the application to vary the landfill permit comprises a qualitative gas risk assessment.

2. Landfill gas monitoring

- 2.1** The site is operated pursuant to an approved Landfill Gas Management Plan (LFGMP). The LFGMP sets out the details of how landfill gas is controlled and monitored at the site, and the monitoring requirements for landfill gas are specified in the relevant tables in Schedule 3 of the Permit. There are no proposals to amend the landfill gas monitoring requirements as a result of the application to vary the permit. The results of the landfill gas monitoring undertaken at the site are reported to the Environment Agency on a quarterly or annual basis pursuant to the requirements of Schedule 4 of the permit.
- 2.2** Table S3.5 of the permit specifies monitoring for landfill gas in external monitoring boreholes and specifies a methane limit of 1% volume/volume (v/v). The monitoring data collected pursuant to Table S3.5 is reported to the Environment Agency on a quarterly basis pursuant to Schedule 4 of the permit. The data for the period January 2021 to March 2025 show that the methane concentrations at the perimeter boreholes specified in Table S3.5 are below the limit of 1% v/v.

3. Conclusions

- 3.1** It is concluded in the 2014 LFGRA that the landfill gas generation rate at Thornhaugh Landfill Site would peak in 2014 and that emissions from the flare would peak in 2015. Landfill gas flow rate data collected for gas volumes delivered for combustion in the flare at the site for the period 2021-2024 show that the quantity of gas combusted in the flare is considerably lower than the quantity predicted in the 2014 LFGRA. The decrease in gas generation is consistent with the waste returns data for 2014-2024 which report that over 99% of the waste accepted at the site during this period was non-biodegradable hence has a very low potential to generate gas. On this basis it is unnecessary to undertake a quantitative assessment of emissions of landfill gas from the site. As a result of the changes to the restoration profile, which are the subject of the application to vary the permit, an additional depth of waste will be placed over some of the landfill area compared with that currently consented. As there are no changes to the types of wastes to be received at the site, which will remain generally consistent with those accepted at the site during the last 10 years or more, the proposals the subject of the application to vary the permit will not change significantly the risk associated with the emissions of landfill gas.
- 3.2** Landfill gas generated in the older part of the existing landfill will continue to be collected and flared.

Compliance with the Landfill Directive

- 3.3** It is considered that the landfill gas management and monitoring plans for the landfill site are compliant with the Landfill Directive. Appropriate measures are taken to control the accumulation and migration of landfill gas. Landfill gas is collected and treated as necessary. The collection and treatment of landfill gas at the landfill is carried out in a manner that minimises risk to people and to the environment.

APPENDICES

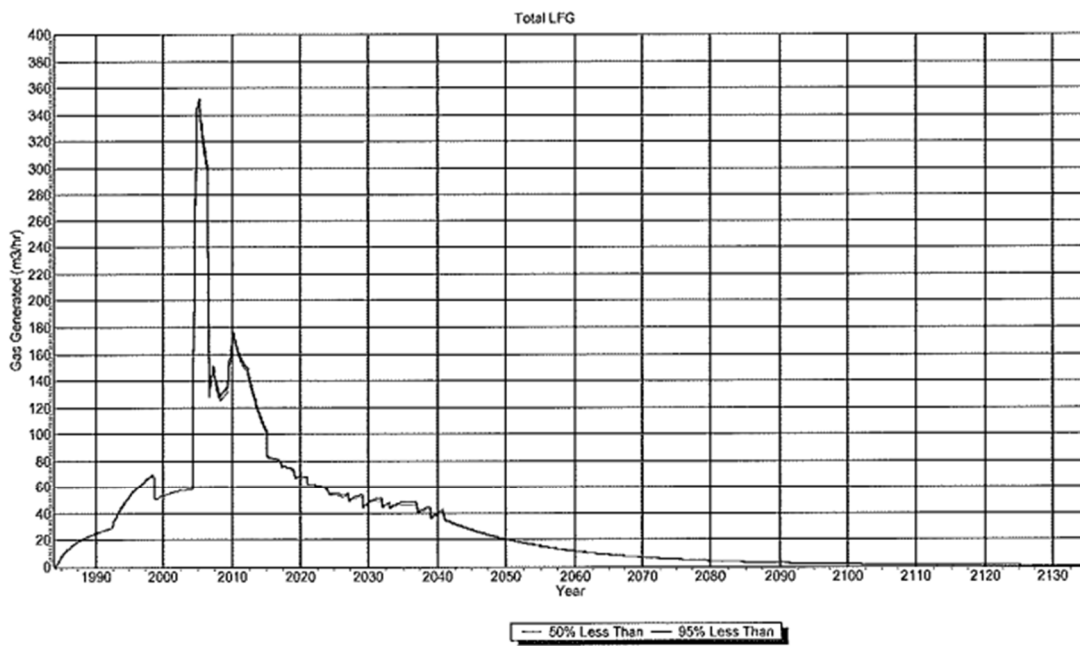
APPENDIX LFGRA A
GAS PRODUCTION AND COMBUSTION CURVES FROM THE 2014 LFGRA

GasSim Version V 2.05

Project Name: Thornhaugh Landfill

Project Client: Augean

Total: Total Bulk LFG Produced



th lfgra sep 2014 - scenarioa 80.gss

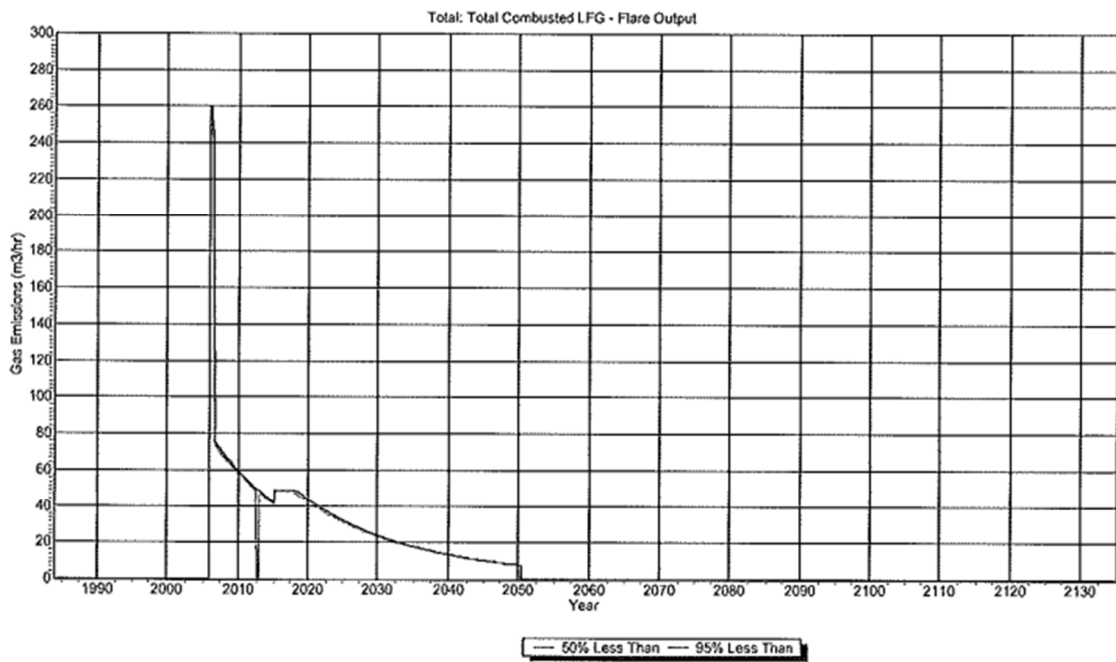
22/09/2014 16:54:14

GasSim Version V 2.05

Project Name: Thornhaugh Landfill

Project Client: Augean

Total: Total Combusted LFG - Flare Output



th lfgra sep 2014 - scenarioa 80.gss

22/09/2014 16:54:14