

Margam Green Energy Limited

Margam Green Energy Plant

Response to NRW further information request – IC5

1 Introduction

An Environmental Permit (EP) (Ref: EPR/DP3137EG) for the operation of the Margam Green Energy Plant, (the Facility) was granted to Margam Green Energy Limited (MGEL) by Natural Resource Wales (NRW) on 20 November 2014. Construction of the Facility commenced on 23 January 2015. Commissioning of the Facility commenced on 22 May 2018 and was completed on 20 June 2019.

The EP includes several Pre-Operational and Improvement Conditions. Improvement condition 5 (IC5) requires the following to be completed within 4 months of the completion of commissioning:

“The Operator shall submit a written report to Natural Resources Wales describing the performance and optimisation of the Selective Non Catalytic Reduction (SNCR) system and combustion settings to minimise oxides of nitrogen (NOx) emissions within the emission limit values described in this permit with the minimisation of nitrous oxide emissions. The report shall include an assessment of the level of NOx and N2O emissions that can be achieved under optimum operating conditions.”

“The report shall also provide details of the optimisation (including dosing rates) for the control of acid gases and dioxins.”

A report was submitted to NRW on 27 January 2020 detailing the optimisation of the SNCR system, acid gas control system and dioxin control system. Following submission of this report to NRW, NRW has requested additional information from MGEL to provide clarification on the emission limits and parameters implemented within the distributed control system (DCS) to control emissions of oxides of nitrogen.

Fichtner Consulting Engineers Ltd ("Fichtner") has been engaged by MGEL to produce a Technical Note to provide the additional information requested by NRW.

2 Additional information request

2.1 NRW clarification

MGEL received a clarification request from NRW on 30 April 2021, which is provided in Appendix A of this Technical Note, relating to the report submitted by MGEL to NRW for the discharge of IC5. The clarification request states the following:

The report discusses the NOx emissions achieved vs limits e.g achieve NOx emissions to 165 mg/Nm3 (dry, 11% O2) versus a limit of 180 mg/Nm3 (dry, 11% O2). I would seek clarity on where these limits have been sourced? I also need clarity on the use of the 11% Oxygen dry

figure? Emission Limit Values within MGELs environmental permit are based on a correction factor conversion from 11% O2 content to 6% O2 dry to reflect that the installation is a co-incinerator plant. The following is an extract from Schedule 6-Interpretation of Margam Green Energy Ltd permit DP3137EG:

Where a minimum limit is set for any emission parameter, for example pH, reference to exceeding the limit shall mean that the parameter shall not be less than that limit.

Unless otherwise stated, any references in this permit to concentrations of substances in emissions into air means in relation to gases from co-incineration plants the concentration in dry air at a temperature of 273K, at a pressure of 101.3 kPa and with an oxygen content of 6% dry

MGELs emission monitoring should also reflect the use of a correction factor to ensure accurate reported data to account for reduced gas volumes.

Clarity on the above should allow NRW to close out IC5.

2.2 MGEL clarification response

Further to the clarification request, MGEL acknowledges that there was an error in the report provided, and the ELV for NOx is not 165 mg/Nm³ as stated and all ELVs stated within the EP are at 6% oxygen (dry), standard reference conditions.

The emission limit values (ELVs) specified in schedule 3, table S3.1 are presented in Table 1.

Table 1: Point source emissions to air - emission limits for continuously monitored species

Pollutant	Reference period	Emission limit (mg/Nm ³)
Nitrogen oxides (NO and NO ₂ expressed as NO ₂)	Half hourly average	600
	Daily average	300
Hydrogen chloride	Half-hourly average	90
	Daily average	15
Hydrogen fluoride	Half-hourly average	6
	Daily average	1.5
Sulphur dioxide	Half hourly average	300
	Daily average	75
Dioxins / furans (I-TEQ)	Periodic (minimum 30 minutes, maximum 8-hour period)	0.1 ng/Nm ³
Notes: All ELVs are stated on a dry gas basis at 6% oxygen and standard temperature and pressure reference conditions.		

MGEL can confirm that the DCS control loop takes into account the emissions of NOx measured at the stack. The setpoint implemented in the DCS for control of the SNCR system is a NOx concentration of 270 mg/m³. MGEL can confirm that the reported emission concentrations are corrected to a reference oxygen concentration of 6% as a dry measurement.

MGEL trusts that the information contained in this Technical Note is acceptable to NRW and will allow it to close out IC5.

Yours sincerely

FICHTNER Consulting Engineers Limited



Simon Render
Senior Environmental Consultant



James Sturman
Lead Environmental Consultant

A NRW Clarification Request

Improvement Condition 5



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To Mark Bull; Paul Fitzsimmons

IC 5 Report MGEL.docx
.docx File

Reply

Reply All

Forward



Fri 30/04/2021 16:33

Afternoon Both,

The following is Improvement Condition 5 from Margam Green Energy Ltd (DP3137EG) environmental permit:

The Operator shall submit a written report to Natural Resources Wales describing the performance and optimisation of the Selective Non Catalytic Reduction (SNCR) system and combustion settings to minimise oxides of nitrogen (NOx) emissions within the emission limit values described in this permit with the minimisation of nitrous oxide emissions. The report shall include an assessment of the level of NOx and N2O emissions that can be achieved under optimum operating conditions. The report shall also provide details of the optimisation (including dosing rates) for the control of acid gases and dioxins

The following is an extract from MGEL ICS Report which is also attached to this email:

Furthermore, the DCS has a control loop which looks at: 1. the flue gas flowrate (which indicates how many grams of NOx is expected every second which needs to be reacted with); 2. the temperatures measured at various points in the furnace to understand how high unabated NOx levels would be at that particular time and also in which locations ammonia is best dosed to avoid waste ammonia (at too low a temperature the ammonia doesn't properly react with NOx and at high temperatures the ammonia thermally decomposes); 3. the emissions of NOx and ammonia measured at the stack; and 4. adjusts the flowrate and injection points of ammonia accordingly to achieve the set point of NOX. We can confirm that the DCS controls to achieve NOx emissions to 165 mg/Nm3 (dry, 11% O2) versus a limit of 180 mg/Nm3 (dry, 11% O2). This provides a margin in case emissions control is poor for short periods and the set point is exceeded but also means that the amount of ammonia used is not excessive. Ammonia emissions are set to a maximum of 5 mg/Nm3 (dry, 11% O2) but these are normally within 0.2 mg/Nm3 (dry, 11% O2) indicating that ammonia dosing is well controlled with limited excess.

The report discusses the NOx emissions achieved vs limits e.g *achieve NOx emissions to 165 mg/Nm3 (dry, 11% O2) versus a limit of 180 mg/Nm3 (dry, 11% O2)*. I would seek clarity on where these limits have been sourced? I also need clarity on the use of the 11% Oxygen dry figure? Emission Limit Values within MGELs environmental permit are based on a correction factor conversion from 11% O2 content to 6% O2 dry to reflect that the installation is a co-incinerator plant. The following is an extract from Schedule 6-

Interpretation of Margam Green Energy Ltd permit DP3137EG:

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MGELs emission monitoring should also reflect the use of a correction factor to ensure accurate reported data to account for reduced gas volumes.

Clarity on the above should allow NRW to close out ICS.

Best Regards,

Ieuan Davies

Uwch Swyddog – Rheoleiddio Diwydiant a Gwastraff / Senior Officer – Industry and Waste Regulation

Tim Rheoleiddio Diwydiant De-Orllewin Cymru / South West Wales Industry Regulation Team

cyfoethnaturiol.cymru / naturalresources.wales

Siaradwr Cymraeg

