




**CDM: Form for submission of requests for deviation prior to submitting request for issuance**

*(To be used by the DOE for requesting a deviation prior to submitting request for issuance)*

<b>Name of the entity (DOE) submitting this form</b>	TÜV Rheinland
<b>Project Ref./Title of the project activity</b>	1371: Proactiva Mérida Landfill Gas Capture and Flaring project
<b>Title/subject of deviation</b>	Deviation from provisions of registered PDD due to delayed installation of flare efficiency continuous monitoring equipment.
<b>Specify the monitoring period for which the request is valid</b>	03 Apr 2008 - 31 Dec 2009
<b>Date and signature for the DOE</b>	22-11-2011 

**Please use the space below to describe the deviation and substantiate the reason for requesting a deviation from provisions of registered monitoring plan.**

The DOE and PPs assessed the following:

1. This deviation takes into account the provisions of the VVM 01.2, EB55, Annex 1, paragraph 214, in which it is stipulated that the request for deviation applies to the monitoring period under verification. Furthermore, in EB 43 Report, paragraph 57 is consider: "The Board agreed that for cases where a delayed installation/operation of a monitoring equipment is observed, a request for deviation can be applied for a period covering the monitoring period under verification until the start of the operation of the equipment..."

2. According to the approved monitoring plan in the registered PDD, to calculate the parameter  $PE_{flare}$  it is necessary to determine the flare efficiency ( $\eta_{flare,h}$ ) as per the Step 6 of the "Tool to determine project emissions from flaring gases containing methane" for enclosed flares and continuous monitoring. This requires a continuous exhaust gas analyzer.

3. However, as a result of very low biogas production at the site (for this monitoring period PPs claims less than 6% of the initially foreseen CERs in this Monitoring Period), the project participants have not installed a continuous monitoring system for the concentration of  $CH_4$  in the exhaust gas of the flare and thus no monitoring data is available to calculate the project emissions from flaring of the residual gas stream in year y,  $PE_{flare,y}$  as per registered PDD. More specifically, the parameters  $tO_{2,h}$  and  $f_{vCH_4,FG,h}$  were not monitored during the Monitoring period as per the registered Monitoring Plan.

4. Technical measures are currently taken and additional investment employed in order to improve the landfill gas capture system. This will decrease the gap between the theoretical gas production predicted in the PDD and the amount of captured gas on site. As a result, the number of CERs generated is expected to increase and thus the PPs ability to invest into monitoring equipment (gas

analyzer for exhaust gas). As mentioned in the official communication of the PPs (/4/) the investment into the additional monitoring equipment is expected for January 2013.

5. For the parameter flare efficiency ( $\eta_{flare,h}$ ), the PP stated in the PDD that "In case the continuous system is unavailable for maintenance, or failure..." a default value will be applied according to Step 6 of the mentioned Tool as follows:

- 0% if the temperature in the exhaust gas of the flare ( $T_{flare}$ ) is below 500 °C for more than 20 minutes during hour h.

- 50%, if the temperature in the exhaust gas of the flare ( $T_{flare}$ ) is above 500 °C for more than 40 minutes during hour h, but the manufacturer's specifications on proper operation of the flare are not met at any point during hour h (manufacturer's specifications state that 90% of the flare efficiency shall met at temperatures above 700°C).

- 90%, if the temperature in the exhaust gas of the flare ( $T_{flare}$ ) is above 500 °C for more than 40 minutes during hour h and the manufacturer's specifications on proper operation of the flare are met continuously during hour h (manufacturer's specifications state that 90% of the flare efficiency shall met at temperatures above 700°C).

During the verified period April 3rd, 2008 – December 31st, 2009 the PP has adopted the above approach to determine the Flare efficiency due to the lack of continuous measurements.

6. In the case of the Proactiva Mérida Landfill Gas Capture and Flaring Project, the manufacturer's specifications on proper operation of the flare in order to apply a 90% default value for  $\eta_{flare,h}$  are:

- flare temperature shall be above 700°C



- WCH4 shall be in a range of 20-80%
- LFGflare shall be in a range of 150-2000Nm3/h

These three conditions have been continuously monitored during the entire Monitoring Period.

Therefore during the verified period, the project participants applied a 90% default value for the flare efficiency  $\eta_{\text{flare,h}}$  for all monitored data with flare temperatures above 700°C. For flare temperatures between 500°C and 700°C, the project participants applied a default factor for the flare efficiency  $\eta_{\text{flare,h}}$  of 50%. In both cases the manufacturer's specifications with regard to WCH4 and LFGflare are respected. For flare temperatures below 500°C the  $\eta_{\text{flare,h}}$  is considered to be 0%.

7. The DOE reviewed the following documents from the Manufacturer in order to confirm the proper operation of the flare is being followed:

-Flare specifications in which it is stated that the combustion temperature, the WCH4 and LFG flare operations ranges are those mentioned above /1/.

-Tflare Thermocouple certificate of conformity in which the operation ranges are indicated from 0°C

– 1,300°C, and the flare manufacturer confirms also it is confirmed that for measures above 700°C the flare efficiency of 90% is guaranteed /2/.

8. Furthermore, an independent laboratory, Intertek, carried out sample measurements to assess the flare emissions by the enclosed flare, on July 11th, 2008. Parameters measured during the study were  $t_{O2,h}$  and  $f_{vCH4,FG,h}$ . The results from this study were used to determine the flare efficiency following

the Steps 1-7 in the "Tool to determine project emissions from flaring gases containing methane". The calculated flare efficiency from average conditions of the sample is 99.91% and in the case of the lowest flare temperature of the sample (695°C) the flare efficiency is the same. This way the PP ensured the adopted approach in points 5 and 6 is accurate and conservative /3/.

9. The DOE confirmed during the on-site visit that the determination of the flare efficiency complies at every time with the proposed approach.

Given the above observations, it is requested that to determine the Flare efficiency this default value may be used based on the default value proposed by the applicable tool and the manufacturer's specifications, for this monitoring period and until the installation of the continuously measurement equipment (exhaust gas analyser – expected in January 2013).

**Please use the space below to describe and substantiate the assessment of the DOE that the deviation does not require a revision of monitoring plan or the changes from the project activity as described in the registered project design document.**

The PPs are expecting to install the missing continuous monitoring equipment in the near future, as indicated in point 4 of this request. This deviation does therefore not ask for a permanent change in the monitoring procedures nor does it constitute a change from the project activity. The PP is willing to reach higher methane and biogas volumes in order to invest in the equipment.

The proposed deviation concerns data which, instead of being calculated is replaced by a default value. The default value is foreseen in the applicable tool as well as in the registered PDD and is conservative. It is suggested to be applied until the time the new monitoring equipment for analysis of exhaust gas is installed. It is therefore understood, that the monitoring plan does not need to be changed.

**Please use the space below to describe the impact of the deviation on the estimates of the emissions reductions for the proposed project activity with the use of approved methodology as existing and with the deviation. Please substantiate the estimations with relevant and verifiable data.**

The application of a default value of 90% for the flare efficiency  $\eta_{\text{flare,h}}$  leads to conservative emission reduction estimations. Although not fully quantifiable, it is expected that emission reduction estimates using

the default value for flare efficiency of 90% are more than 9% lower than those that otherwise have been calculated with the default value. Flare efficiency tests /3/ performed at the Merida landfill have shown values in excess of 99% when manufacturer's specifications are met and the registered PDD assumed a flare efficiency of 97% for ex-ante estimations of ERs.

Based on the information reviewed and that presented within this Request for Deviation, the DOE can confirm that the approach adopted is the most conservative approach and the one that should be used in the  $\eta_{\text{flare,h}}$  and consequently in the ER calculations.

**Link to the monitoring report**

<https://cdm.unfccc.int/Projects/DB/TUEV-SUED1191330441.32/iProcess/TUEV-RHEIN1264751695.18/view>

**If necessary, list attached public files containing relevant information which is not available through the above link**

Flare specifications

Thermocouple Conformity certificate

Flare efficiency test

Official written communication from the PP regarding the expected installation

