

 <p style="text-align: center;"><b>CDM: Revision Form for Approved Methodologies (version 01)</b> (To be used for responding to requests for revision on approved methodologies)</p>	
Date of Meth Panel meeting:	06 – 09 June 2006
Title/Subject (give a small title or specify the subject of your submission, maximum 200 characters):	Alternative approaches to: Monitoring of flare efficiencies and use of thermal-mass flow meters, in approved methodology ACM0001
Indicative methodology to which your submission relates	ACM0001: “Consolidated methodology for landfill gas project activities”
Name of the authors of the query:	Det Norske Veritas Certification Ltd.
<p><b>Summary of the query:</b></p> <p>Please use the space below to summarize the request for revision on the related approved methodologies.</p> <p>&gt;&gt; The request for revision proposes the introduction of the following changes in the approved consolidated methodology ACM0001:</p> <p><b>1) Alternatives approaches for monitoring flaring efficiency</b></p> <p>It is proposed to include in the methodology three alternative approaches:</p> <p>a) Default value for flare efficiency: Following the prescriptions of ACM0008 page 31, it is proposed to adopt default values of 99% for enclosed flares and 50% for open flares.</p> <p>b) Flare efficiency based on flame temperature:</p> <ul style="list-style-type: none"> <li>• adopting a set of temperatures related to a certain efficiency; or</li> <li>• adopting a dynamic curve providing a continuous measurement of flare efficiency.</li> </ul> <p><b>2) Use of thermal-mass flow meters</b></p> <p>The methodology requires to measure the pressure (P) and temperature (T) of the landfill gas to determine the volumes in normalized cubic meters. If the flow meter automatically measures P and T, expressing the volumes in normalized cubic meters, the separate monitoring of P and T is not required. It is requested to allow the use of thermal-mass flow meters, which directly measure mass flow rate, providing the readings in Nm<sup>3</sup> or kg.</p>	

**Recommendation by the Meth Panel:**

Please use the space below to provide amendments /changes (in your expert view, if necessary).

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**1) Alternatives approaches for monitoring flaring efficiency****a) Default value for flare efficiency**

The view of the Meth Panel is that default values do not provide the required precision in estimating the emission reduction from a project activity. It recognizes that measuring the flare efficiency in open flares is difficult, whereas, in the case of enclosed flares, the measuring is feasible on a periodic or even continuous basis without any difficulty. The Meth Panel recommends that in cases where measurements of flare efficiency is not undertaken, a default value of 50% efficiency can be used, otherwise project proponents are welcome to use a flare efficiency value based on periodic or continuous measurement.

**b) Flare efficiency based on flame temperature**

It is known that flare efficiency is related to the residence time, combustion temperature and turbulence (Three Ts of combustion). The request provides some references to support the claim that the combustion temperature can be used to estimate flare efficiency. The information provided could be used to support that temperature is an indication of correct functioning of a landfill capture system, but cannot be used to estimate precisely the amount of methane destroyed in the flare. In this particular case, it should be noted that the information provided for a specific flare is based on one particular experiment.

**2) Use of thermal-mass flow meters**

The principle of functioning of thermal-mass flow meters is based on the fact that the rate of heat absorbed by a flow stream is directly proportional to its mass flow. The molecules of a moving gas come into contact with a heat source, absorbing heat and then cooling the source. If the flow is increased, more molecules come into contact with the source, absorbing more heat. The amount of heat dissipated from the heat source is proportional to the number of molecules of a particular gas (its mass), the thermal characteristics of the gas, and its flow characteristics.

Therefore, in view of the Meth Panel the composition of the gas should be known, and the content of other gases in the biogas should also be monitored. In view of this, it is requested that the request should be further elaborated.

**Answer to authors of the request for revision by the Meth Panel :**

Please use the space below to provide an answer to the authors of the above query

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- Default value for flare efficiency

In cases where measurements of flare efficiency is not undertaken a default value of 50% efficiency can be used, otherwise project proponents are welcome to use a flare efficiency values based on periodic or continuous measurement.

- Flare efficiency based on flame temperature

As flare efficiency is a function of temperature of the flare, residence time and turbulence, temperature alone can't be used alone as a proxy for monitoring the flare efficiency.

- Use of thermal-mass flow meters

Regarding the use of thermal-mass flow meter, the request should be further elaborated, considering that the composition of the gas should be know if its flow is metered using a thermal-mass meter, and the additional parameters should be measured.



Signature of the Meth Panel Chair .....

Date: 21/06/2006 (Rajesh Kumar Sethi)



Signature of the Meth Panel Vice-Chair .....

Date: 21/06/2006 (Jean-Jacques Becker)

**Information to be completed by the secretariat**

F-CDM-AM	F-CDM-AM-REV-0012
Date when the form was received at UNFCCC secretariat	21 June 2006
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