 <p style="text-align: center;">CDM: Proposed new methodology expert form (version 03) (To be used by methodology experts providing desk review for a proposed new methodology)</p>	
Name of expert responsible for completing and submitting this form	Steve Thorne
Related F-CDM-NM document ID number	NM-0021
<p><i>Note to those completing this form, as applicable: Please provide recommendations on the proposed new baseline and monitoring methodologies based on an assessment of annexes 3 and 4 and of their application in sections A to E of the draft CDM PDD, desk reviews and public input. Please ensure that the form is entirely filled and that arguments and expert judgements are substantiated.</i></p>	
A. Evaluation of the proposed new methodologies by desk reviewers:	
I. Evaluation of the new baseline methodology:	
Title of new baseline methodology:>> CERUPT Methodology for Landfill Gas Recovery	
<p>i. Conditions under which this methodology is applicable to other potential projects (e.g. project type, region, data availability, etc.):</p> <p>>> Brazilian landfill gas projects and others where there is no legislation that includes destroying the LFG (landfill gas). Venting of gases to avoid explosions is the only requirement by law.</p> <p>ii. Strengths and weaknesses of the methodology:</p> <p>>> Simplicity but not universally applicable. There is a disconnect between the baseline and project emissions calculations and the monitoring.</p> <p>iii. Any changes needed to improve the methodology:</p> <p>a. Minor changes:>> 1. "The amount of emission reductions is estimated by distracting the amount of emissions in the baseline situation with the amount of emission in the project situation. The final amount of emission reductions is based on the amount of landfill gas combusted. In absence of the project the amount captured would otherwise have been emitted to the air." (PDD Section B.4 (P9) and again annex 3 para 6 p37.) This needs to be corrected "distracting" should become "subtracting" and "with" becomes "from".</p> <p>2. "Qf = total landfill gas to flare (m3/hr) (measured) Qe = total landfill gas to evaporator (m3/yr) (measured)" PDD section D3 p13 "m3/hr" should be changed to "m3/year" in the definition of Qf A question: Is the interpretation of "Common Practice" A project that is economically the most attractive course of action can be additional if there is an indication that the project type is not common practice (e.g. occurs in less than 5 percent of similar cases) in the proposed area of implementation, and is not required by recent/pending legislation/regulations." This must be confirmed as should the interpretation of "proposed area of implementation" (Annex 3 para 6 P34).</p> <p>b. Major changes: >> The small-scale definition of landfill baselines is more operational than the definition provided here. The PDD gives the baseline as all emissions from the</p>	

landfill and uses a theoretical model to estimate this. The small-scale definition is easier in that instead of making the baseline all emission from the landfill, it covers "only the capture and flaring that would not have happened in the absence of the project activity" (para 87 of the appendix b of the simplified M&P for small-scale CDM project activities), which is far more operational a definition as it can be accurately measured ex-post. The current baseline definition is the reason that there is a disconnect between the monitoring explained in D and the calculations in E.

II. Evaluation of the new monitoring methodology:

Title of new monitoring methodology: >> CERUPT methodology for landfill gas recovery

- i. Conditions under which this methodology is applicable to other potential projects (e.g. project type, region, data availability, etc.):
>> See comments on baseline methodology above.
- ii. Strengths and weaknesses of the methodology:
>> See comments on baseline methodology above.
- iii. Any changes needed to improve the methodology:
 - a. Minor changes:>> Pressure and temperature of the gas going to the flare/leachate evaporator must be measured. Landfill policy must be monitored.
 - b. Major changes: >> Sections D and E must refer to each other closer.

B. Details of the evaluation of the proposed new methodology by the desk reviewer:

I. Proposed new baseline methodology (specify title here): >>

(1) Short description of the methodology, including an assessment of which approach from paragraph 48 of the CDM modalities and procedures was used:

a) Describe the methodology:

>> The methodology is entitled "CERUPT Methodology for Landfill Gas Recovery"

It is based on interpretation of M&P para 48b: "Emissions from a technology that represents an economically attractive course of action, taking into account barriers to investment." "Additionality testing for LFG projects entails three steps:

1. Assessment of legal requirements
2. Assessment of economic attractive courses of action (as per M&P para 48b)
3. Assessment of barriers and common practice." Annex 3 para 6 page 33.

This project is looking to have credits backdated implying that it has already commenced. That it has started begs questions as to its additionality.

b) State the approach selected:

>> The baseline selected is the emissions from a technology that represents an economically attractive course of action, taking into account least-cost path. In this case this is interpreted using IRRs least cost path of action. The methodology includes steps to theoretically estimate the expected yearly emissions of methane that would have been emitted to the atmosphere from the landfill, the treatment of the leachate and the avoided transport emissions to take the leachate for treatment. Leakage is positive (from transport and the reduction of grid electricity required to run the blowers) and ignored on the basis of applying conservative practices. In the baseline situation all gas would have been emitted to the atmosphere.

c) Indicate (in summary form) why the approach selected is the most appropriate. Please provide

your expert judgement on the appropriateness of the selected approach to the project category:

>> The baseline selected is the emissions from a technology that represents an economically attractive course of action, taking into account least-cost path. In this case this is interpreted using IRRs least cost path of action. The methodology includes steps to theoretically estimate the expected yearly emissions of methane that would have been emitted to the atmosphere from the landfill, the treatment of the leachate and the avoided transport emissions to take the leachate for treatment. Leakage is positive (from transport and the reduction of grid electricity required to run the blowers) and ignored on the basis of applying conservative practices. In the baseline situation all gas would have been emitted to the atmosphere.

(2) Basis for determining the baseline scenario:

a) State whether the documentation explains how the baseline scenario is to be chosen and identified:

>> The selection of how the baseline scenario is chosen is identified.

b) State the basic underlying rationale for algorithms/formulae used (e.g. marginal vs. average basis (see also section 4 below):

>> to establish the most economically attractive course of action

c) State whether the documentation explains how, through the use of the methodology, it can be demonstrated that a project activity is additional and therefore not the baseline scenario. If so, what are the tools provided by the project participants?

>> Yes, it shows that without carbon financing the most economically attractive course of action would be continue the status quo which would not reduce emissions further than the baseline (as this is the baseline situation).

d) State whether the basis for determining the baseline scenario and for assessing additionality is appropriate and adequate:

>> The methodology compares two scenarios (of a potential of 9 listed in annex 3 para 6), the current situation (without recovery and offsite leachate treatment) and the project activity and concludes that the current situation is the least cost path in the absence of carbon financing.

The methodology is limited in application to project activities conducted in the absence of legislation and other reasons for the extraction of landfill gas. IRRs which are used to assess the least cost path needs to be calculated optimistically in order to comply with the conservatism required in the selection of the baseline scenario and therefore to test whether the project is additional.

(3) Assessment of the description of the proposed methodology and its applicability

a) State whether the methodology has been described in an adequate manner:

>> The methodology description is adequate in its explanation but it is unlikely to be adequate in its operationalisation.

b) State whether the proposed methodology is appropriate for the referred proposed project activity and the referred project context (described in Sections A-E of the draft CDM-PDD and submitted along with Annex 3):

>> The methodology is appropriate to a situation where legislation does not require any activity other than that currently conducted, i.e. no enforced methane recovery or extraction and destruction. The problem with the methodology is that it develops a theoretical model for the entire annual emissions from the landfill. This is one approach, but the figures it generates cannot be accurately verified, because all the emissions cannot be measured in order to calibrate the model. Sample wells can, however, be used to extrapolate and calibrate the model. While the model is useful in understanding the potential CERs available, the question that needs to be answered is what is the quantity of methane emissions recovered and not vented to the atmosphere? The baseline methodology estimates this by assuming a proportion of the gases that could be captured, once again theoretically. The project document makes this point "In LFG projects baseline

emissions are determined ex post by monitoring the amount of LFG extracted. As such the estimation of baseline emissions ex ante as part of the PDD is not so relevant." This renders the baseline calculations useful for estimating CERs but hardly verifiable.

c) State whether the application of the methodology could result in a baseline scenario that reasonably represents the anthropogenic emissions by sources of greenhouse gases that would occur in the absence of the proposed project activity.

>> Yes.

Please explain:

>> Actual emissions reductions will be monitored ex-post. Emissions reductions estimates are as good as models can predict under the physical and legal uncertainty associated with landfills.

(4) Assessment of algorithms/formulae and type of data needed:

a) State whether the description of the methodology includes algorithms and generic formulae that can be applied to other potential project activities (If not, the proposed new methodology will be considered as a project-specific methodology.):

>> The approach while being theoretically sound, but leaves a gap for the validators in asserting whether the correct "k" value has been used (the range is between 0.1 and 4 dependent upon moisture and organic content). The project participant has made clear on numerous occasions that the emissions reductions and the baseline will only be verifiable ex-post. The estimation of the quantity of methane A3.2 mentions correction for temperature but there is no correction for pressure. Gas density is related to its volume, temperature and pressure. The potential leakage associated with flare efficiency is not included, this is an oversight. There is limited link between the monitoring and the calculations. The monitoring is empirical the calculations are theoretical. It is the reviewer's understanding that the monitoring and the formulae should complement each other. i.e. what is monitored is inserted into the formulae in estimating the emissions reductions achieved by the project activity.

b) Explain the spatial scope of data used to determine the baseline and whether the scope is appropriate:

>> The spatial data could refer to legislation, common practices, barriers to practice whether institutional or costs of capital and in estimating the emissions to climate (moisture in the landfill, due to rain and/or linings) required by law.

c) Explain the vintage of data used (in relation to the duration of the project crediting period) and whether the vintage of data is appropriate, indicating the period covered by data:

>> The vintage is appropriate as it is current and the project is looking to have credits back dated to 1/1/2003.

(5) Definition of the project boundary related to the baseline methodology:

a) State how the project boundary is defined in terms of:

i) Gases and sources

>> covers all sources of emissions affected by the project activity during operation (and construction) and makes a clear distinction between activities inside and outside the project boundary. Leakage is thus clearly defined.

ii) Physical delineation

>> The physical boundary is related technologies that affect the project activity emissions. The boundary includes the landfill, the leachate treatment plant and the flare.

b) Indicate whether this project boundary is appropriate:

>> Yes, the boundary excludes leakages that are positive thus contributing to a conservative estimate of emissions.

(6) Key assumptions/parameters (including emission factors and activity levels) and data sources:

a) List the implicit and explicit key assumptions. Identify those, if any, which are problematic and explain:

>> 1. There is no legal requirements or local need requiring the landfill operator to destroy any of the landfill gas. 2. there are only two possible scenarios the current situation and the project scenario.

b) State whether the key assumptions are arrived at in a transparent manner:

>> The landfill gas is estimated from landfill operation logs for the SASA landfills. IPCC default values are the other source of data. The assumptions are derived in a transparent manner.

c) Give your expert judgement on whether the assumptions/parameters are adequate:

>> yes.

d) Indicate which data sources are used and how the data are obtained (e.g. official statistics, expert judgement). Identify whether the data used are complete and state possible data gaps:

>> the assumptions are acceptable, but the legal issues needs to be monitored as part of the MVP.

e) Give your expert judgement on whether the data used are adequate, consistent, accurate and reliable:

>> The data used to establish baselines will be obtained ex-post, and therefore an opinion at this stage is inappropriate. The data generated from the models provides merely an indication of the quantity of CERs. Flare efficiency should be added.

(7) Assessment of uncertainties:

a) State whether the methodology includes an assessment of uncertainties regarding:

i) The basis for determining the baseline scenario:

>> yes

ii) Algorithms/formulae:

>> no

iii) Key assumptions:

>> no

iv) Data:

>> no

b) State whether the uncertainties presented are reasonable:

>> yes, but incomplete.

(8) Leakage:

a) State how the baseline methodology addresses any potential leakage due to the project activity:

>> it identifies leakage and concludes that it is positive (leachate transportation and avoided diesel for generator) and chooses to ignore it on the basis of conservatism. The flare efficiency which potentially is negative leakage is not addressed.

b) Indicate whether the treatment for leakage is appropriate and adequate?

>> In part yes, but ignoring flare efficiency should be rectified. (The flare efficiency need not be a leakage issue, as it is within the project boundary.)

(9) Transparency and “conservativeness”:

a) Indicate whether the baseline methodology was developed in a transparent way:

>> yes, with the exception of using a high IRR estimate. (A high IRR is conservative in testing the case of what constitutes the baseline).

b) State whether the baseline methodology is conservative:

>> The baseline is a model and depending on the choice of the "k" value will be conservative or not. The reviewer does not have an opinion on the choice of the k value for the landfill under consideration. However, the argument of whether the baseline is conservative or is irrelevant to the issuance of CERs which is based on the monitoring of actual gas flows.

(10) Potential strengths and weaknesses of the baseline methodology (please explain):

>> The methodology is simple. It is limited in its application.

(11) Other considerations, such as a description of how national and/or sectoral policies and circumstances have been taken into account (please explain):

>> It includes the venting policy, which in terms of the emissions has no effect. The methodology includes points that should policies/legislation change the baseline will be reviewed accordingly.

(12) Applicability of the proposed methodology across project types and regions (please indicate):

>> Methodology is limited to applications where there is no policy/legislation.

(13) Any other comments:

a) State whether any other source of information (i.e. other than documentation on this proposed methodology available on the UNFCCC CDM website) has been used by you in evaluating this methodology. If so, please provide specific references:

>> No other documentation. The NovaGerar and Durban landfills.

b) Indicate any further comments:

>> To repeat, the lack of tie up between the theoretical estimates of emissions and the actual estimates of emissions based on monitoring is the weakness. The NovaGerar landfill baseline methodology includes a 20% discount in the emissions reductions to allow for the possibility of the introduction of legislation at some stage in the future. This innovation may be appropriate in all Brazilian landfill gas projects.

II. Proposed new monitoring methodology (specify title here): >>
<i>In respect of the proposed new monitoring methodology, evaluate each section of Annex 4. Please provide your comments section by section:</i>
<p>(1) Brief description of new methodology:</p> <p><i>Describe new methodology:</i></p> <p>>> "The CERUPT monitoring methodology for land fill gas recovery is designed primarily to be used in relation with the CERUPT methodology for landfill gas recovery. It is acceptable to assume that the volume of LFG actually recovered is an indication of the volume of gas that would have been emitted without the project. This will be monitored." (annex 4 para 1 page 43 of PDD). The description is adequate but falls short of achieving its ends.</p>
<p>(2) Key assumptions/parameters:</p> <p><i>a) List the implicit and explicit key assumptions. Identify those, if any, which are problematic and explain:</i></p> <p>>> The methodology as expressed here is appropriate but falls short of achieving what it sets out to achieve by omitting parameters in its application. It is not certain whether the omissions are in pursuit of simplicity or if parameters have been genuinely overlooked.</p> <p><i>b) State whether the key assumptions are arrived at in a transparent manner:</i></p> <p>>> No, the explanations for the omission of certain variables and in some cases where they should be measured is not clear.</p> <p><i>c) Give your expert judgement on whether the assumptions/parameters are adequate:</i></p> <p>>> The monitoring protocol requires revision to make it adequate.</p>
<p>(3) Data sources and data quality:</p> <p><i>a) Indicate which data sources are used and how the data are obtained (e.g. official statistics, expert judgement). Identify whether the data used are complete and state possible data gaps:</i></p> <p>>> The emissions are predicted based on records of landfill composition and quantities fed into models. The remaining data is gathered from monitoring though there is inadequate information extracted there to calculate the emissions with accuracy. The monitoring does not specify where exactly in the LFG extraction and use "plant" the data is measured in some instances.</p> <p><i>b) Give your expert judgement on whether the data used are adequate, consistent, accurate and reliable:</i></p> <p>>> Additional data are required to maintain a conservative estimate of CERs.</p>

(4) Assessment of the description of the proposed methodology and its applicability:

a) State whether the proposed methodology has been described in an adequate manner:

>> No, it needs further elaboration.

b) State whether the proposed methodology is appropriate for the referred proposed project activity and the referred project context (described in Sections A-E of the draft CDM-PDD and submitted along with Annex 4):

>> The methodology as expressed here is appropriate but falls short of achieving what it sets out to achieve by omitting parameters in its application. It is not certain whether the omissions are in pursuit of simplicity or if parameters have been genuinely overlooked. Annex 4 is strong on description but weak on method.

c) State whether this proposed monitoring methodology is compatible with the proposed baseline methodology described in annex 3 of the draft CDM-PDD:

>>The monitoring and baseline need to be linked in a clearer way.

(5) Leakage (please elaborate, if appropriate):

>> Positive leakage has been considered (not monitored) and omitted but negative leakage is not adequately monitored and reflected (i.e. flare efficiency and pipe leakage (though this would be difficult to measure only deducted through differences between extraction and burning)).

(6) Quality assurance and control procedures (please explain):

>> Other than the vacuum control, the QA/QC seems not to be used for any further monitoring or control calibration.

(7) Potential strengths and weaknesses of the methodology (please explain):

>> The methodology aims to be simple but in doing so may be excluding issues such as steam condition unnecessarily if it is unrelated to calculating emissions reductions (apparently from the rest of the PDD) but omits monitoring of key issues such as flare efficiency and policy fluctuations.

(8) Applicability of the proposed methodology across project types and regions (please indicate): It needs to fixed before it can be applied anywhere.

>>


(9) Any other comments:

a) State whether any other source of information (i.e. other than documentation on this proposed methodology available on the UNFCCC CDM website) has been used by you in evaluating this methodology. If so, please provide specific references:

>>no

b) Indicate any further comments:

>> I am concerned by the lack of link-up between monitoring and formulae for calculating emissions reductions. (for example why is steam condition monitored but no where used the calculations?)

Signature of desk reviewer ... 	
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