

Ref: Project Activity 0925

UNFCCC Secretariat  
Martin-Luther-King-Strasse 8  
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Germany

09 December 2010

Dear Members of the CDM Executive Board

Validation opinion - Request for revision of monitoring plan for Project activity 0925  
"EnviroServ Chloorkop Landfill Gas Recovery Project"

The project participant EnviroServ Waste Management (Pty) Ltd has commissioned ERM Certification and Verification Services (ERM CVS) to conduct the second periodic verification of the project activity, 0925: "EnviroServ Chloorkop Landfill Gas Recovery Project". During the first verification, SGS United Kingdom Ltd, raised one FAR with two sub-items which required a revision to the monitoring plan. During the site visit for the second verification ERM CVS observed and confirmed that the actual monitoring has changed from the original monitoring plan as per the registered PDD (as recorded in the FARs raised in the first verification). Hence EnviroServ Waste Management (Pty) Ltd also commissioned ERM CVS to provide a validation opinion for the revision of the monitoring plan as per the registered PDD and submit the request for revision to the EB.

With reference to the procedure for revision of the monitoring plan adopted at EB 26 and updated at EB 49, ERM CVS hereby requests a revision to the monitoring plan for the registered project activity 0925 titled "EnviroServ Chloorkop Landfill Gas Recovery Project".

**Project Background**

EnviroServ Chloorkop Landfill Gas Recovery project's aim is to reduce GHG emissions through the destruction of methane by extracting landfill gas at the Chloorkop landfill site and combusting the landfill gas by flaring, with the option of producing electricity in the future. The project activity was registered as a CDM activity on 27 April 2007 for a seven year renewable crediting period with average estimated emission reductions of 188,390 tCO<sub>2</sub>e per annum. A request was submitted to the EB to change the crediting period to be in alignment with the project start date. The EB approved the request and the crediting period runs from 19 January 2008 – 18 January 2015 (renewable). The first verification by SGS, for the period 19 January 2008 to 31 December 2008, resulted in the issuance of 83,135 CERs.

## Revision to the Monitoring Plan

The project uses approved methodology AM0011 “Approved baseline methodology for Landfill gas recovery with electricity generation and no capture or destruction of methane in the baseline scenario”, version 02, dated 30 September 2005. In line with the EB requirements, a revision to the original monitoring plan of the registered PDD is required if the monitoring plan is not in accordance with the monitoring methodology applied to the registered CDM project activity and/or does not reflect the actual monitoring activity based on the registered PDD. A request for revision must be supported by an opinion from the DOE that confirms compliance of the revision with the approved methodology and that the level of accuracy and completeness in the monitoring and verification process is not reduced as a result of the revision.

## Summary of revisions made and ERM CVS opinion

The proposed revision to the monitoring plan includes the issues raised as FARs in the first verification report as follows:

- a. In the original monitoring plan (refer to section **B7.1 Data and parameters monitored** on page 16 - 23 of the registered PDD), it was outlined that the following parameters will be monitored:
- i. Q - Total amount of landfill gas collected ( $\text{m}^3$ )
  - ii. Methane fraction in landfill gas ( $\%, \text{g}/\text{m}^3$ )
  - iii.  $\text{LFG}_{\text{leachate},y}$  - Total amount of landfill gas used for leachate evaporation ( $\text{m}^3$ )
  - iv.  $\text{LFG}_{\text{electricity},y}$  - Total amount of landfill gas used for electricity generation ( $\text{m}^3$ )
  - v.  $\text{LFG}_{\text{flared},y}$  - Total amount of landfill gas flared ( $\text{m}^3$ )
  - vi.  $\text{LFG}_{\text{app i},y}$  - Total amount of landfill gas destroyed in application (e.g. boiler, engine) ( $\text{m}^3$ )
  - vii. FE - Flare efficiency (combustion efficiency) (%)
  - viii.  $T_{\text{LFG}}$  - Temperature of landfill gas ( $^{\circ}\text{C}$ )
  - ix.  $P_{\text{LFG}}$  - Pressure of landfill gas (Pa)
  - x. Flare hours - Flare working hours (hours)
  - xi. Flare temperature - Temperature of flare ( $^{\circ}\text{C}$ )
  - xii. EL - Electricity generated (kWh)
  - xiii.  $\text{EL}_{\text{IMP}}$  - Electricity consumed by project (blowers) (kWh)

In the revised monitoring plan, the following parameters have been removed as per the FAR#1 raised in the first verification report, and the instruction given in CDM-EB-49 paragraph 57(g):

- i.  $\text{LFG}_{\text{app i},y}$  - Total amount of landfill gas destroyed in application (e.g. boiler, engine) ( $\text{m}^3$ ).

This parameter has been deleted as it is not applicable under the methodology AM0011 version 02.

ERM CVS has verified this by checking the methodology and confirms that this parameter is not mentioned in the table in pg 7 and 8 of methodology AM0011 version 02, which outlines the parameters to be monitored and recorded.

ERM CVS concludes that this change is in compliance with the methodology and has no impact on the accuracy or completeness of the reported emission reductions.

ii.  $T_{LFG}$  - Temperature of landfill gas ( $^{\circ}C$ )

This parameter has been removed from section B.7.1 in the revised monitoring plan (and section B.7.2 and Annex 4 have been updated accordingly) as no separate monitoring of temperature and pressure of the LFG is required.

ERM CVS has verified, through inspecting the equipment on site and reviewing the data, that the mass flow meters measuring the LFG flow are thermal mass flow meters that compensate for pressure and temperature. The LFG volumetric flow is expressed in Normal cubic meters ( $Nm^3$ ) after compensating for pressure and temperature.

ERM CVS concludes that this change is in compliance with the methodology and has no impact on the accuracy or completeness of the reported emission reductions. Furthermore, the removal of this parameter from the revised monitoring plan satisfies the CDM-EB instruction in CDM-EB-49 paragraph 57(g).

iii.  $P_{LFG}$  - Pressure of landfill gas (Pa)

This parameter has been removed from section B.7.1 in the revised monitoring plan (and section B.7.2 and Annex 4 have been updated accordingly) as no separate monitoring of temperature and pressure of the LFG is required.

ERM CVS has verified through inspecting the equipment on site and reviewing the data that the mass flow meters measuring the LFG flow are thermal mass flow meters that compensate for pressure and temperature. The LFG volumetric flow is expressed in Normal cubic meters ( $Nm^3$ ) after compensating for pressure and temperature.

ERM CVS concludes that this change is in compliance with the methodology and has no impact on the accuracy or completeness of the reported emission reductions. Furthermore, the removal of this parameter from the revised monitoring plan satisfies the CDM-EB instruction in CDM-EB-49 paragraph 57(g).

During the second periodic verification ERM CVS identified discrepancies in the original monitoring plan that are additional to those raised in the FARs from the first verification report. ERM CVS therefore raised corrective action requests for additional revisions to the monitoring plan to address the following:

- b. In the original monitoring plan (refer to section **B7.1 Data and parameters monitored** on page 16 - 23 of the registered PDD), the units of the following parameters were expressed in m<sup>3</sup>:
- Q - Total amount of landfill gas collected
  - LFG<sub>leachate,y</sub> - Total amount of landfill gas used for leachate evaporation
  - LFG<sub>electricity,y</sub> - Total amount of landfill gas used for electricity generation
  - LFG<sub>flared</sub> - Total amount of landfill gas flared

In the revised monitoring plan, the unit of the above parameters has been changed to Normal cubic meters (Nm<sup>3</sup>), after compensating for temperature and pressure, as this ensures consistency between the parameters currently measured (namely Q and LFG<sub>flared</sub>) and is a true reflection of the actual monitoring, as confirmed during the site inspection. Once electricity is generated and/or leachate evaporation is introduced in the project activity, the parameters LFG<sub>electricity,y</sub> and LFG<sub>leachate,y</sub> will be incorporated into the existing monitoring equipment/systems and will be measured and recorded in Normal cubic meters (Nm<sup>3</sup>) as well.

ERM CVS verified this change during the on site visit and confirms that it is in compliance with the methodology and has no impact on the accuracy or completeness of the reported emission reductions.

- c. In the original monitoring plan (refer to section **B7.1 Data and parameters monitored** on page 16 - 23 of the registered PDD), the unit for the methane fraction of landfill gas was %, g/m<sup>3</sup> and the parameter did not include the *Data / Parameter* which is in accordance with the methodology.

In the revised monitoring plan, the unit has been changed to % and *Data / parameter* (W<sub>CH<sub>4</sub></sub>) was included, which is in accordance with the monitoring report and the CER calculation workbook. The methodology (AM0011 version 02) does not specify the *Data / Parameter* to be used but W<sub>CH<sub>4</sub></sub> is in accordance with the Monitoring Report, and later versions of the methodology.

ERM CVS verified this change during the on site visit and confirms that it is in compliance with the methodology and has no impact on the accuracy or completeness of the reported emission reductions.

- d. Further revision to the original monitoring plan have been made
- to provide further details on calibration procedures and accuracies of the meters; and
  - to update the information in Annex A to be consistent with the revised monitoring plan.

ERM CVS verified this change during the on site visit and confirms that it is in compliance with the methodology and has no impact on the accuracy or completeness of the reported emission reductions.

In summary, as per the requirements of the Validation and Verification Manual regarding the Request for revision of the Monitoring Plan, the revisions made to the monitoring plan include:

- a. the exclusion of three parameters (namely  $LFG_{app\ i,y}$ ,  $T_{LFG}$ ,  $P_{LFG}$ ) required to close out the FAR#1 from the initial verification report;
- b. the change in data units (in this case Normal cubic meters) for all parameters as per the requirements of the methodology AM0011 version 02 (previously expressed as  $m^3$  in the registered PDD);
- c. the change in units from  $\%g/m^3$  to  $\%$  for the methane fraction in landfill gas;
- d. details on the calibration procedures and accuracies of the monitoring equipment; and
- e. updating the Monitoring Information in Annex 4 to be consistent with corrections made in the revised monitoring plan and to include the monitoring parameters for '*Amount of Landfill gas used for electricity generation*', '*Amount of electricity generated*' and '*Amount of landfill gas used for leachate evaporation*'.

Physical equipments were checked during the site visit on the 08 April 2010 and ERM CVS confirmed that the revised monitoring plan fully represents the actual monitoring activities that have been implemented and operated on site.

ERM CVS has verified all of the above and concludes the following:

1. As per the requirements of paragraph 9(a) Annex 28 of EB49, ERM CVS confirms that the proposed revision of the monitoring plan ensures that the level of accuracy and completeness in the monitoring and verification process is not reduced as a result of the proposed revision of the monitoring plan; the monitoring parameters that were removed were done so on instruction of the CDM-EB and to close out FAR#1 raised in the initial verification, the corrections made to the data units are accurate and correct, additional information regarding the manufacturer's requirements for calibration of equipment and reference to international standards are included in the revision, and the quality assurance and quality control procedures have been updated accordingly.
2. As per the requirements of paragraph 9(b) Annex 28 of EB49, it is ERM CVS's opinion that the above revision to the monitoring plan are as per the requirements of the methodology AM0011 "Approved baseline methodology for Landfill gas recovery with electricity generation and no capture or destruction of methane in the baseline scenario" version 02 (dated 30 September 2005) against which this project activity is registered.
3. As per the requirements of paragraph 9(c) Annex 28 of EB49, this is the second periodic verification, and as such, findings from the initial verification (namely FAR#1) and also findings raised in the ERM CVS draft verification report for the second periodic

verification, following the site visit, have been addressed in the revision of this monitoring plan.

Therefore, ERM CVS recommends the acceptance of the revised monitoring plan submitted by the project participant.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'Mel Eddis'.

Melanie Eddis  
Head of Climate Change  
*On behalf of ERM Certification and Verification Services Ltd*