



VERIFICATION REPORT INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

VERIFICATION OF THE UGANDA MUNICIPAL WASTE COMPOST PROGRAMME

REPORT No.BVC/KENYA-VR/0003/2013

REVISION No. 01.1

BUREAU VERITAS CERTIFICATION

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VERIFICATION REPORT

Date of first issue: 22/07/2014	Organizational unit: Bureau Veritas Certification Holding SAS
Client: International Bank for Reconstruction and Development as the Trustee of the community Development Carbon Fund(CDCF)	Client ref.: Mr. Chassard Joelle
<p>Summary:</p> <p>Bureau Veritas Certification has conducted the 1st periodic verification of Uganda Municipal Waste Compost Programme, CDM Registration Reference Number 2956 , a project of International Bank for Reconstruction and Development as the Trustee of the community Development Carbon Fund(CDCF), which is located in Uganda, and applying the methodology AMS III.F Version 06, on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM rules and modalities and the subsequent decisions by the CDM Executive Board, as well as the host country criteria.</p> <p>The verification scope is defined as an independent and objective review and ex-post determination of the monitored GHG emission reductions, and consisted of the following three phases: i) desk review of the project design, the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion. The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.</p> <p>In summary, Bureau Veritas Certification confirms that the project is implemented as planned and described in the approved revised project design documents. Installed equipments being essential for generating emission reduction run reliably and are calibrated appropriately. The monitoring system is in place and the project is generating GHG emission reductions. The GHG emission reductions are calculated without material misstatements, and the emission reductions verified totalize 16,549 tons of CO₂e for the monitoring period.</p> <p>Our opinion relates to the projects' GHG emissions and resulting GHG emission reductions reported and related to the valid and registered project baseline, approved revised monitoring plan and its associated documents.</p> <p>Reporting period: 12/04/2010 to 30/04/2012 Baseline emissions: 28,747 t CO₂ equivalents. Project emissions: 12,198 t CO₂ equivalents. Leakage emissions: 0 t CO₂ equivalents. Emission Reductions: 16,549 t CO₂ equivalents.</p>	

Report No.: BVC-Kenya/VR0003/2013	Subject Group: CDM
Project title: Uganda Municipal Waste Compost Programme	
Work carried out by: Mr. James Chirchir - Team Leader Mr. Srinivasan Selvaraj - Team Member	
Internal Technical Review carried out by: Mr. Bhavesh Prajapati	
Date of this revision: 22/08/2014	Rev. No.: 01.1
Number of pages: 106	

Indexing terms

Work approved by:

Ms. Anna Kalacheva

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Abbreviations

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reductions
CL	Clarification Request
CO ₂	Carbon Dioxide
CO ₂ e	Carbon Dioxide Equivalent
DOE	Designated Operational Entity
DRR	Daily Reading Record
ETN	Electricity Transaction Note
FAR	Forward Action Request
GHG	Green House Gas(es)
MoV	Means of Verification
MP	Monitoring Plan
MR	Monitoring Report
MRR	Monthly Reading Record
PDD	Project Design Document
PLF	Plant Load Factor
PP	Project Participant
PPA	Power Purchase Agreement
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard



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1. INTRODUCTION

International Bank for Reconstruction and Development as the Trustee of the Community Development Carbon Fund (CDCF) has commissioned Bureau Veritas Certification to verify the emissions reductions of CDM project Uganda Municipal Waste Compost Programme (hereafter called "**the Project**") in Uganda.

This report summarizes the findings of the verification of the Project, performed on the basis of UNFCCC criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1. Objective

The objective of CDM verification is to conduct a thorough, independent assessment of the registered project activities.

In carrying out its verification work, the DOE shall ensure that the project activity complies with the requirements of paragraph 62 of the CDM modalities and procedures. In particular, this assessment shall:

- (a) Ensure that the project activity has been implemented and operated as per the approved revised PDD, and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;
- (b) Ensure that the monitoring report and other supporting documents provided are complete in accordance with latest applicable version of the completeness checklist for requests for issuance of CERs, verifiable, and in accordance with applicable CDM requirements;
- (c) Ensure that actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan or any revised approved monitoring plan, and the approved methodology including applicable tool(s);
- (d) Evaluate the data recorded and stored as per the monitoring methodology including applicable tool(s).

1.2. Scope

The verification scope is defined as an independent and objective review and ex-post determination of the monitored GHG emission reductions. The verification is based on the validated and registered project design document, the monitoring report, emission reduction calculation spreadsheet, and supporting documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations.

The verification is not meant to provide any consulting service towards the PPs. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project monitoring towards reductions in the GHG emissions.



1.3. GHG Project Description

The project activity involves aerobic decomposition of organic fraction of municipal solid wastes in Uganda. This results in avoidance of methane emissions that would have otherwise been emitted to the atmosphere from the organic matter left to decay anaerobically in a solid waste disposal site. The project activity replaces the common practice in Uganda where municipal solid wastes are disposed in landfills/controlled dumpsites resulting in generation and emission of significant amount of methane to the atmosphere, in addition to contamination of wetlands by the leachate generated from these landfills.

The technology employed for municipal solid waste management in the project activity is the aerobic windrow based composting and proper soil application of the resulting compost. The project involves the following steps: the collection of the waste generated and transportation to identified waste disposal sites by the town/ municipal councils; sorting of these wastes; composting of the organic fraction in aerobic windrows; sieving of the resulting composts; selling of the compost and landfilling of the rejects/non decomposed fraction. Non degradable fractions of the solid wastes are also landfilled.

The aerobic composting process produces a saleable compost product from a waste material that would otherwise have been placed in a landfill hence generating large quantities of methane and other noxious gases, as well as leachate that seeps into and pollutes ground and surface waters at the landfill sites.

The project activity is undertaken by municipalities (the CPA implementers) who have signed agreements with National Environment Management Authority (NEMA) of Uganda, the Coordinating/Managing Entity (CME). The following municipalities are involved in the PoA; Jinja(CPA 1), Fort Portal(CPA 2), Kabale(CPA 3), Kasese(CPA 4), Lira(CPA 5), Mbale(CPA 6), Mukono(CPA 7) and Soroti(CPA 8). Each of the CPAs has a composting plant with design capacity of 70 tons per day (TPD) of solid wastes. As per registered CPA-DDs, the typical waste handled per annum would be about 25550 tons per annum. About 5000 tons of compost would be generated per annum resulting in average of 8370 ton of emission reduction per year for the first 7 year crediting period.

Project title: Uganda Municipal Waste Compost Programme

UNFCCC ref 2956
number:

Registration 12/04/2010

Date:

Crediting 12/04/2010 to 11/04/2017 (renewable) – CPA 1

Period: 19/04/2011 to 18/04/2017 (renewable)- CPA 2 to CPA 8

Monitoring 12/04/2010 to 30/04/2012 - CPA 1:

Period: 19/04/2011 to 30/04/2012 - CPA 2 – CPA 8:

Project Participants: International Bank for Reconstruction and Development as the Trustee of the community Development Carbon Fund(CDCF).



Methodologies used AMS III.F Version 06
Location of the Project: Uganda
Geo coordinates: Longitude: 32°34'52" E, Latitude: 0°18'49" N
UNFCCC view page: http://cdm.unfccc.int/ProgrammeOfActivities/poa_db/JL4B8R2DKF90NE6YXCVOQ3MWSGT5UA/view

[Post Registration Changes]

A request for approval of temporary deviation and permanent changes from the monitoring plan as described in the registered POA-DD has been submitted prior to the submission of the request for issuance and approved by the Board on 16/06/2014(Ref:/13/). The following deviations as detailed in validation opinion report (Ref: /04/) were requested by the PP and approved by the Board.

- In the registered PoA-DD, Leachate accumulated in the tank over a period of 24 hours shall be calculated (on volume basis) with measurements for the area of the tank and the depth of leachate accumulated in the tank using standard measuring scales and tapes. However, during the implementation phase of the project, the monitoring approach in the registered PoA DD was found not practical as there were difficulties in emptying the leachate tank and handling the leachate at all the facilities. In the proposed changes for the measurement of volume of run-off water, leachate accumulated in the tank over a period of 24 hours shall be calculated (on volume basis) with measurements for the area of the tank and the depth of leachate accumulated in the tank using standard free board. The depth from leachate surface to the tank top is measured by freeboards two consecutive days once in a month to determine the daily volume of accumulated leachate and the average leachate generation rate (m³/day) shall be converted to annual leachate generation. The project proponents proposes that for the first monitoring period, based on available literature, the leachate production in composting ranges from a rate 0.07-0.09 M³ per tonne of fresh waste. A value of 0.091 M³ of leachate per tonne of fresh waste has been assumed for this monitoring period.
- As detailed in Table 4.2 of the registered PoA-DD, in order to monitor aerobic conditions during composting, Oxygen availability in the aerated piles will be monitored once a month on a sample basis using standard methods, such as use of oxygen meters. No records of oxygen monitoring were available for review for this monitoring period for all the CPAs. The project participant proposes that the aerobic condition of the waste being composted was kept through regular turning and compost was produced and therefore requests for the operations procedures as an alternative approach for guaranteeing the aerobic conditions of the waste being treated for the first verification period. The verification team noted that there was no foul smell in the composting sites. Records of compost sold or given out and compost rejects for the monitoring period were well maintained and the team was of the opinion that these indicated a well operated composting process.

- In section E.7.1 of the registered PoA-DD, the composition of incoming waste will be determined by sampling and analysis. Samples will be taken once in a month, translating to 12 samples in a year. The average composition will be used in all calculations. However, the project activity was unable to secure services of a competent authority to conduct waste characterisation analysis and this therefore resulted in missing waste characterisation data for the period 12/04/2010 to 28/02/2011 and March – April 2012. The project proponents proposes to apply the values from the same month of the next year to account for possible seasonal variations and of next two months, namely May and June 2012 for March and April for the first monitoring period.

1.4. Verification Team

The assessment team and internal technical reviewer team consist of the following personnel:

FUNCTION	NAME	TA 13.1	TA X.X	TASK PERFORMED*
Team Leader	Mr. James Chirchir	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> DR <input checked="" type="checkbox"/> SV <input checked="" type="checkbox"/> RI <input type="checkbox"/> TR
Team Member	Mr. Srinivasan Selvaraj	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> DR <input checked="" type="checkbox"/> SV <input type="checkbox"/> RI <input type="checkbox"/> TR
Technical Specialist	N.A.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> DR <input type="checkbox"/> SV <input type="checkbox"/> RI <input type="checkbox"/> TR
Internal Technical Reviewer (ITR)	Mr. Bhavesh Prajapati	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> DR <input type="checkbox"/> SV <input type="checkbox"/> RI <input checked="" type="checkbox"/> TR
Specialist supporting ITR	N.A.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> DR <input type="checkbox"/> SV <input type="checkbox"/> RI <input checked="" type="checkbox"/> TR

*DR = Document Review; SV = Site Visit; RI = Report issuance; TR = Internal Technical Review

2. METHODOLOGY

The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

In order to ensure transparency, a verification protocol was customized for the project, according to the version 07.0 of the CDM Validation and Verification Standard, issued by CDM Executive Board after its 79th meeting on 01/06/2014 /9/. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from verifying the identified criteria. The verification protocol serves the following purposes:

- It organizes, details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent verification process where the verifier will document how a particular requirement has been verified and the result of the verification.

The completed verification protocol is enclosed in Appendix A to this report.

2.1. Review of Documents

The assessment of the project documentation provided by the project participant is based upon both quantitative and qualitative information on emission reductions. Quantitative information comprises the reported numbers in the monitoring report (MR) version 04 dated 13/08/2014/6/ and emission reduction calculation spreadsheet version 02 dated 11/07/2014 /7/. Qualitative information comprises information on internal management controls, calculation procedures, and procedures for transfer of data, frequency of emissions reports, and review and internal audit of calculations.

The monitoring report version 01 submitted by the project participant was web hosted on the UNFCCC-CDM web site on 27/02/2013 and thus, was available in the public domain.

In addition to the monitoring documentation provided by the project participants, the DOE reviews:

- (a) The registered PoA-DD and CPA-DDs and the monitoring plan, including approved revised monitoring plan, and the corresponding validation opinion (Ref: /1/ & /3/).
- (b) The validation report /3/
- (c) The applied monitoring methodology ref: /8/

2.2. Follow-up Interviews

On 15/04/2013 to 21/04/2013 Bureau Veritas Certification performed a site visit in all the CPAs and interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of International Bank for Reconstruction and Development as the Trustee of the community Development Carbon Fund(CDCF) and National Environmental Management Authority (NEMA) were interviewed (see References). The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organization	Interview topics
International Bank for Reconstruction and Development as the Trustee of the community Development Carbon Fund(CDCF)	<ul style="list-style-type: none"> ➤ Project Design and implementation ➤ Technical equipment, calibration and operation ➤ Monitoring Plan and management procedures ➤ Monitoring data ➤ Data uncertainty and residual risks (QA/QC) ➤ GHG Calculation ➤ Environmental Impacts ➤ Compliance with National Laws and Regulations
National Environmental Management Authority (NEMA)	<ul style="list-style-type: none"> ➤ Monitoring Plan ➤ Monitored data and Monitoring Report ➤ GHG Calculations



2.3. Resolution of Clarification, Corrective and Forward Action Requests

The objective of this phase of the verification is to resolve issues related to the monitoring, implementation and operations of the registered project activity that could impair the capacity of the registered project activity to achieve emission reductions or influence the monitoring and reporting of emission reductions prior to Bureau Veritas Certification's positive conclusion on the GHG emission reduction calculation.

Findings established during the verification can either be seen as a non-fulfillment of criteria ensuring the proper implementation of a project or where a risk to deliver high quality emission reductions is identified.

A Corrective Action Request (CAR) is raised, if one of the following situations occurs:

- (a) Non-compliance with the monitoring plan or methodology are found in monitoring and reporting and has not been sufficiently documented by the project participants, or if the evidence provided to prove conformity is insufficient;
- (b) Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants;
- (c) Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impact the quantity of emission reductions;
- (d) Issues identified in a FAR during validation to be verified during verification or previous verification(s) have not been resolved by the project participants.

A Clarification Request (CL) is raised, if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

A Forward Action Request (FAR) is raised, for actions if the monitoring and reporting require attention and/or adjustment for the next verification period.

To guarantee the transparency of the verification process, the concerns raised are documented in more detail in the verification protocol in Appendix A.

2.4. Internal Technical Review

The verification report underwent an Internal Technical Review (ITR) before requesting issuance of CERs for the project activity.

The ITR is an independent process performed to examine thoroughly that the process of verification has been carried out in conformance with the requirements of the verification scheme as well as internal Bureau Veritas Certification procedures.

The Team Leader provides a copy of the verification report to the reviewer, including any necessary verification documentation. The reviewer reviews the submitted documentation for



conformance with the verification scheme. This will be a comprehensive review of all documentation generated during the verification process.

When performing an Internal Technical Review, the reviewer ensures that:

- The verification activity has been performed by the team by exercising utmost diligence and complete adherence to the CDM rules and requirements.
- The review encompasses all aspects related to the project which includes project design, baseline, additionality, monitoring plans and emission reduction calculations, internal quality assurance systems of the project participant as well as the project activity, review of the stakeholder comments and responses, closure of CARs, CLs and FARs during the verification exercise, review of sample documents.

The reviewer may raise Clarification Requests to the verification team and discusses these matters with Team Leader.

After the agreement of the responses on the Clarification Requests from the verification team as well as the PP(s), the finalized verification report is accepted for further processing such as uploading via the UNFCCC interface.

3. VERIFICATION CONCLUSIONS

In the following sections, the conclusions of the verification are stated.

The findings from the desk review of the original monitoring documents and the findings from interviews during the follow up visit are described in the Verification Protocol in Appendix A.

The Clarification, Corrective and Forward Action Requests are stated, where applicable, in the following sections and are further documented in the Verification Protocol in Appendix A. The verification of the Project resulted in 05 CAR(s), 15 CL(s) and 04 FAR(s).

The CARs, CLs and FARs were closed based on adequate responses from the Project Participant(s) which meet the applicable requirements. They have been reassessed before their formal acceptance and closure.

The number between brackets at the end of each section corresponds to the VVS paragraph.

3.1. Remaining issues from validation or previous verification (258)

Two (2) FARs were raised during the validation of this project activity. The PP has addressed the FARs and they have been reviewed by the DOE as follows:

Forward Action Request (FAR)	PP's Action as described in the Monitoring report	DOEs verification and conclusion
FAR 1: The following CPAs belonging to stage 2 of the Programme will	Since the registration of the PoA, 8 more CPAs have been included	FAR 1 was requested regarding the validation of



require a new Letter of Approval of the Ugandan DNA. (Resolution details included in Table 3)	<p>in the PoA and all of them have been mentioned in the PoA Letter of Approval issued by the Ugandan DNA. Please refer to the attachment 1.</p> <p>Therefore the FAR that was raised at validation makes reference to the new letter of approval that will be required for the inclusion of the following CPAs (10th CPA onwards), as the current letter only makes specific reference to the 9 which have already been included.</p>	CPAs not approved by the DNA, which exclude the first 9 CPAs verified during these period. Hence, FAR 1 is not applicable for this period of verification.
FAR 2: The sample methodology decided to choose the number of CPAs to be verified shall be validated during the verification stage.	All 8 CPAs of emission reductions generations during the first monitoring period were visited and verified in the 1 st verification stage.	The verification team visited all the 8 CPAs whose emission reductions have been reported during this verification period.

3.2. Compliance of the project implementation with the registered project design document (273)

Bureau Veritas Certification has performed a site visit in all the CPAs and found that the Project has been put into operation and the compost generated is sieved and sold/given out to users as per requests and orders received. Eight composting plants, one for every CPA, with a design capacity of 70 tons per day (TPD) of solid wastes have been in operation during the monitoring period.

Changes to the project monitoring plan in the registered project activity have occurred and identified during this verification. A request for approval of changes has been submitted prior to the submission of the request for issuance and approved by the Board on 16/06/2014(Ref: /13/). The implementation and operation of the project activity have been conducted in accordance with the description contained in the approved revised POA-DD.

The project activity involves aerobic windrow based composting of organic fraction of municipal solid wastes in Uganda. The steps followed are: the collection of the waste generated and transportation to identified waste disposal sites by the town/ municipal councils involved; sorting



of these wastes; composting of the organic fraction in aerobic windrows; sieving of the resulting composts; selling of the compost and landfilling of composting residuals/rejects and non-degradable fractions of the solid wastes. The following municipalities are involved in the PoA; Jinja(CPA 1), Fort Portal(CPA 2), Kabale(CPA 3), Kasese(CPA 4), Lira(CPA 5), Mbale(CPA 6) , Mukono(CPA 7) and Soroti(CPA 8). Each of the CPAs has a composting plant with design capacity of 70 tons per day (TPD) of solid wastes. The following infrastructure has been provided for each CPA;

- Barrier at the boundaries of the site and a gate at entry to avoid any unauthorized entry to site.
- Windrow bays with a roof.
- A site office block.
- Equipment consisting of a wheel loader, temperature probe, a weighing scale and a simple set of sieves for compost sieving, a Leachate pump, a leachate tank, water storage tanks and a standard wooden box for measurement of density of compost and rejects.

The construction works of the composting plant in CPA 1 started on 30/10/2007. The plant was commissioned on 07/08/2009 and waste was first delivered on site on 02/09/2009. The project activity was registered on the 12/04/2010. The compost plant has been in operation since its commissioning and it operated for 620 days during this monitoring period.

The construction works of the composting plant in CPA 2 started on 30/10/2007, and the plant was commissioned in 12/08/2009. The project activity was registered on the 19/04/2011. The compost plant has been in operation since its commissioning and it operated for 296 days during this monitoring period.

The construction works of the composting plant in CPA 3 started on 30/10/2007, and the plant was commissioned in September 2010 and waste was first delivered on site on 21/09/2010. The project activity was registered on the 19/04/2011. The compost plant has been in operation since its commissioning and it operated for 320 days during this monitoring period.

The construction works of the composting plant in CPA 4 started on 30/10/2007, and the plant was commissioned in 13/08/2009. The project activity was registered on the 19/04/2011. The compost plant has been in operation since its commissioning and it operated for 259 days during this monitoring period.

The construction works of the composting plant in CPA 5 started on 30/10/2007, and the plant was commissioned in 04/08/2009. The project activity was registered on the 19/04/2011. The compost plant has been in operation since its commissioning and it operated for 281 days during this monitoring period.

The construction works of the composting plant in CPA 6 started on 30/10/2007, and the plant was commissioned in 06/08/2009. The project activity was registered on the 19/04/2011. The compost plant has been in operation since its commissioning and it operated for 314 days during this monitoring period. The compost plant has been in operation since its commissioning and it operated for 305 days during this monitoring period.

The construction works of the composting plant in CPA 7 started on 30/10/2007, and the plant was commissioned in 10/08/2009. The project activity was registered on the 19/04/2011. The



compost plant has been in operation since its commissioning and it operated for 305 days during this monitoring period.

The construction works of the composting plant in CPA 8 started on 30/10/2007, and the plant was commissioned in 05/08/2009. The project activity was registered on the 19/04/2011. The compost plant has been in operation since its commissioning and it operated for 313 days during this monitoring period.

During the site visit, the verification team assessed and confirmed that all physical features of the project activity in the registered PDD are in place and that the project participants have operated the project activity as per the Instructions and requirements in the Operational Monitoring Procedure (OMP).

[Management and Operation]

The PP has operated the Project as per the registered PoA-DD, except on the changes highlighted in section 1.3 above. The monitoring organization has been set up and all monitoring staffs have been trained.

According to the registered PoA-DD, in order to ensure a successful operation of the Programme and the credibility and verifiability of the CERs achieved, the Programme will have a well-defined management and operational system, which will be documented in the CDM Operations and Monitoring Manual (OMP). The CDM Operations and Monitoring Plan shall be finalized after registration of the PoA in order to embrace the final monitoring plan contained in the registered POADD document. During this verification period, the verification team reviewed the CDM Operations and Monitoring Manual (Ref: /10/).

A CDM Management Unit was established within NEMA organizational structure to manage the preparation and implementation phases of the proposed CDM program of activity. The CDM Management unit is responsible for organizing and supervising all of the monitoring activities required in the registered monitoring plan for the purpose of accurate and timely reporting of CERs generated. A three-tier management structure has been set up for CDM monitoring. This includes: 1) project team at NEMA level for quality assurance/control of project data, training and routine monitoring; 2) data review and quality control at municipality level for consistency and correctness checks of data generated; 3) on-site working team for daily data monitoring and recording. The verification team confirms that all monitoring staff have been trained as per records of employment contracts, and training records (training logs) (Ref: /11/) reviewed and interviews with representatives of NEMA and Municipalities during site visit. From the assessment, the verification team confirms that the PP has implemented the Management System including the organization structure and responsibilities to determine effectiveness of the monitoring process in line with the OMP. The Monitoring plan provides the management and operational procedures for monitoring, recording, data management - including backup, audit and training for relevant personnel involved in the Project.



Corresponding to the paragraph 273 of VVS version 07.0, Bureau Veritas Certification can confirm that:

- The implementation of the Project is consistent with the approved revised PDD.



- The Project is operated as per the approved revised PDD by the PP.

3.3. Compliance of the monitoring plan with the monitoring methodology including applicable tool(s) (277)

The verification team has verified the monitoring plan, including the data and parameters required to be monitored, measurement procedures, monitoring frequency and QC/QA procedures as described in the approved revised PoA-DD.

- ✌ Corresponding to the paragraph 277 of VVS version 07.0, Bureau Veritas Certification can confirm that the monitoring plan is in accordance with the approved methodology including applicable tool(s) applied by the Project.

3.4. Compliance of monitoring activities with the monitoring plan (280-281)

Monitoring has been carried out in accordance with the approved revised monitoring plan contained in the registered PDD.

[Parameters and information flow]

The parameters required by the monitoring plan and how Bureau Veritas Certification has verified the information flow (from data generation, aggregation, to recording, calculation and reporting) for these parameters including the values in the monitoring report are described below:

Parameters monitored:

Parameter monitored	Verification Team's assessment and conclusion
1. Fuel consumption for equipment used in the composting process in this monitoring period (Fcons)	By reviewing fuel purchasing sales receipts and invoices, the verification team confirms that the PP has continuously monitored this parameter as per the monitoring plan in all the composting sites. No discrepancies were noted between the hard copy fuel receipts sampled and the entries for the same in the databases. The verification team employed acceptance sampling as described in CDM "Sampling and surveys for CDM project activities and programme of activities" version 04.0 (refer to site visit agenda In Appendix B of this report for details of the sampling approach employed by the verification team).
2. Compost Produced and Transported	By reviewing the register for daily outgoing composts and associated compost receipts, the



(Q _{ycomp})	verification team confirms that the quantities of composts produced and transported was monitored in accordance to monitoring plan in all the composting sites. The data had been accurately transferred to the project database since no anomaly was noted for the sampled quantities.
3. Average Truck Capacity - CT _{y,comp}	The verification team reviewed the calculations on the project ER calculator (Ref: /7/) for the estimation of this parameter and deems the estimation as correct.
4. Average distance for compost transportation(DAF _{comp})	The verification reviewed this parameter and found that the values of average distance for compost transportation to end users were drastically reduced as compared to registered CPA-DDs. The PP provided as justification for this, indicating that the difference was due to the fact that at the time of validation, it was expected that the compost would be bought by different private entities and companies. However during implementation, the main consumers of the compost were in and near by the city where the plants are operating. The compost is transported to the city center or schools located in the neighborhood for free. The verification team deemed this as justifiable. The verification team further reviewed the calculations on the project ER calculator (Ref: /7/) for the estimation of this parameter and deems the estimation as correct.
5. Electricity consumed (MWH _{ey})	<p>The verification team confirmed during the site visit that the following sites were not connected to grid power: Kabale, Mukono, Soroti, Kasese. Lira and Mbale.</p> <p>By the review of power utility bills from utility service provider (for CPA 2 & 6), UMEME, the verification team confirms that parameter has been monitored correctly as per the monitoring plan. Data from the utility bills had been correctly posted in the project database after conversion.</p>
6. CO ₂ emission factor of the grid (CEF)	By the review of electricity generation data from



electricity)	UETCL for the previous year (Ref: /18/) and the application of relevant formulae and emissions factors specified in the PDD for the calculation of this parameter, the verification team confirms that the resulting calculation of this parameter is correct and appropriate.
7. Annual electricity generation from fuel type m(EG _m ,y-1)	Fuel wise electricity generation data from UETCL for the previous year (Ref: /18/) was reviewed by the verification team and the team confirms that the values provided by the PP are correct.
8. Quantity of residual organic waste landfilled (W _{x,residual})	By the review of data for daily rejects volume, and results of third party assessment (Makerere University Department of Agricultural Production) of the rejects composition, the verification team confirms that the resulting calculation of this parameter as per the spreadsheet provided(Ref: /7/) is correct and appropriate.
9. Weight fraction of waste type j in the residual waste(P _{n,j,x,residual})	By the review of Waste Composition Analysis conducted by a third party – Makerere University Department of Agricultural Production, the verification team confirms that the parameter had been monitored as per requirements of the monitoring plan. The values applied in the calculations are as per records reviewed during site visit and as approved by the executive board on 16/06/2014
10. Volume of runoff water (Q _{y,ww,runoff})	Since no records were available for this value during site visit by the verification team, 0.091M ³ per tonne of solid waste delivered to composting sites has been applied as approved by Executive Board on 16/06/2014 following a post registration change request by PP
11. COD of runoff water (COD _{y,ww,runoff})	The verification team, through the review of waste characterization Report by Makerere University Department of Agricultural Production, a third party, who carried out the sampling and analysis of wastes, confirms that the parameter had been monitored as per requirements of the monitoring



	plan
12. Total Quantity of organic waste prevented from disposal (W _x)	By the review of daily waste receipt register for incoming solid wastes in all the composting sites, the verification team confirms that the parameter has been monitored in compliance with the monitoring plan. No discrepancies were noted in the transfer of data from the hard copies to the project data base for sampled data during the site visit.
13. Weight Fraction of waste type j in the incoming waste sample (P _{n,j,x})	Waste characterization data for the period 12/04/2010 to 28/02/2011 and March – April 2012 were missing during site visit by the verification team. The project proponents proposed to apply the values from the same month of the next year to account for possible seasonal variations and of next two months, namely May and June 2012 for March and April for the first monitoring period. The request has been approved by the executive board on 16/06/2014 following a post registration change request by PP. The verification team reviewed the applied waste composition analysis values for the proposed period and confirms that it had been correctly applied as approved by the board and as per waste characterization report reviewed during site visit.
14. Fraction of Methane captured at the SWDS and flared , combusted or used in another manner(f)	A default value of zero(0), has been correctly applied as per registered PoA DD of the Uganda Municipal Waste Compost Program
15. Global Warming Potential of Methane (GWPC _{H4})	Global Warming Potential (GWP) of methane, valid for the relevant commitment period, has been taken at 21 for the first commitment period of Kyoto protocol. The verification team confirms that the parameter is as per table 2.14 of IPCC Fourth Assessment Report: Climate Change 2007.

Parameters determined ex-ante:

The following parameters of the 1st crediting period of the Project have been determined ex-ante in the registered PDD. The parameters used in the monitoring report has been verified against the PDD and found them to be consistent.

- i. Values from 2006 IPCC Guidelines for National Greenhouse Gas Inventories combined with data from Ugandan references

Parameter	Unit of measure	Value
EF_{CO_2}	kg CO ₂ / km	0.545
EF_{Fuel}	kg CO ₂ / litre	2.727
EF_m	TCO ₂ / MWh	Diesel: 0.68
		Heavy Fuel Oil: 0.71
		Biomass = 0
		Hydro = 0
$EF_{m\text{ IPCC},2006}$	Kg CO ₂ / TJ	Diesel: 74100 kg CO ₂ / TJ
		Heavy Fuel Oil: 77400 kg CO ₂ / TJ
$B_{o,ww}$	Kg methane / kg COD	0.25
MCF		0.8
DOC _f		0.5

- ii. Values from IPCC 2006 Guidelines for National Greenhouse Gas Inventories (adapted from Volume 5, Table 3.3)

Parameter	Value (%)
DOC _j	
Waste Type	
Wood and wood products	43
Pulp, paper and cardboard (other than sludge)	40
Food, food waste beverages and tobacco (other than sludge)	15
Textiles	24
Garden, yard and park waste	20
Glass, plastic, metal, other inert waste	0
k_j	
Waste Type	
Pulp, paper and cardboard (other than sludge), textiles	0.07
Wood and wood products	0.035
Other (non-food) organic putrescible garden and park waste	0.07

Food, food waste, beverages and tobacco (other than sludge)	0.4
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iii. Values from AMS III F version 06

Parameter	Unit of measure	Value
EF_{composting}	Kg CH ₄ /ton waste	4 kg / ton wet waste
MCF_{ww, treatment}		0.3

iv. Values from Tool to calculate the emission factor for an electricity system Ver 1.1

Parameter	Unit of measure	Value
η_u	%	39.50%

v. Values from Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site version 4.0

Parameter	Unit of measure	Value
OX		0

✌ Corresponding to the paragraph 280 and 281 of VVS version 07.0, Bureau Veritas Certification can confirm that:

- The monitoring has been carried out in accordance with the monitoring plan contained in the approved revised PDD.
- All parameters required by the monitoring plan have been sufficiently monitored and correctly listed. The monitored data for required parameters have been verified by checking the whole information flow.

3.5. Compliance with the calibration frequency requirements for measuring instruments (288)

[Calibration frequency]

In this monitoring period, the activities that required direct measurement of parameters were the measurement of total quantity of outgoing compost for the purpose of determining the density, the measurement of the total quantity of waste prevented from disposal and electricity consumed. It was identified that the calibration of the weighing scales for CPA 2 – CPA 8 which were to be done annually had been delayed during the monitoring period between 19/04/2011 and 30/04/2012. The weighing scales were of the same model for these CPAs. However, the calibration had been implemented after the monitoring period in consideration. Records of calibration for weighing scale for CPA 1 were in order. A clarification was raised to this effect as detailed in CL 15, in table 2 below. A conservative approach is adopted in the calculation of emission reductions as follows:

The PP has applied 1% error, which is over and above the maximum permissible error of the instrument($\pm 0.5\%$) to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration, since the results of the delayed calibration did not show any errors in the measuring equipment. This was in compliance to the requirements of EB 52, Annex 60.

The calibration of electricity meters was a responsibility of the utility company, UETCL, thus the PP was not responsible.

Corresponding to the paragraph 288 of VVS version 07.0, Bureau Veritas Certification can confirm that:

- For calibration that has been delayed, the conservative approach is adopted in the calculation of emission reductions and deemed as appropriate.

3.6. Assessment of data and calculation of emission reductions (291)

Partial data are not available because activity levels parameters have not been monitored in accordance with the registered monitoring plan. A request for deviation was submitted prior to submitting the request for issuance and approved by the Board on 16/06/2014 as per email confirmation (Ref: /13/).

As per the methodology AMS III.F Version 06 and the registered PDD, the emission reductions for the Project are calculated as the baseline emissions minus the project emissions and leakage. Hence the emission reduction is determined by the following formula:

$$ER_y = BE_y - PE_y - L_y$$

Where,

ER_y : Emission reductions

BE_y : Baseline emissions

PE_y : Project emissions

L_y : Emissions due to leakage

[Baseline emissions]

As per the applied methodology, the baseline emissions are the amount of methane emitted from the decay of the degradable organic carbon in the biomass solid waste composted or anaerobically digested in the project activity and includes emissions from wastewater co-composted in the project activity if wastewater is co-composted. However, in this project project activity and as verified from site visit by the verification team through observation and interview with the PP, no waste water was co-composted, no electricity or thermal energy consumed at the site in the absence of the project activity and no methane which requires to be captured and combusted. Hence, as per the tool applied (Ref: /12/), the following equation is applied;

$$BE_y = BE_{CH_4,SWDS,y} - (MD_{y,reg} * GWP_{CH_4}) + (MEP_{y,ww} * GWP_{CH_4})$$

BE = the baseline emissions for the monitoring period (tCO₂e)

BE_{CH₄,SWDS} = yearly methane generation potential of the solid waste composted by the project during the years “x” from the beginning of the project activity (x=1) up to the year “y” estimated as described in the applied tool.

MEP_{ww} = methane emission potential of the wastewater co-composted, equals Zero

MD_{reg} = methane emissions that would be captured and destroyed to comply with national or local safety requirement or legal regulations in the monitoring period (tCO₂e), equals Zero.

GW_{PCH₄} = Global Warming Potential (GWP) of methane, valid for the relevant commitment period, taken at 21 for the first commitment period of Kyoto protocol

Hence,

$$BE_y = BE_{CH_4,SWDS,y}$$

Where

$$BE_{CH_4,SWDS,y} = \phi \cdot (1-f) \cdot GWP_{CH_4} \cdot (1-OX) \cdot \frac{16}{12} \cdot F \cdot DOC_f \cdot MCF \cdot \sum_{x=1}^y \sum_j W_{j,x} \cdot DOC_j \cdot e^{-k_j(y-x)} \cdot (1-e^{-k_j})$$

where

ϕ = Model correction factor (default 0.9) to correct for the model-uncertainties

f = Fraction of methane captured at the SWDS and flared, combusted or used in another manner.

GW_{PCH₄} = Global Warming Potential (GWP) of methane, valid for the relevant commitment period

OX = Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste).

F = Fraction of methane in the SWDS gas (volume fraction) (0.5)

DOC_j = Fraction of degradable organic carbon (by weight) in the waste type j

MCF = Methane Correction Factor (fraction)

$W_{j,y}$ = Amount of organic waste type j prevented from disposal in the SWDS in the year y (tonnes/year)

DOCf = Fraction of degradable organic carbon that can decompose

k_j = Decay rate for the waste stream type j

j = Waste type category (index)

x = Year during the crediting period: x runs from the first year of the first crediting period ($x=1$) to the year y for which avoided emissions are calculated ($x=y$)

y = Year for which methane emissions are calculated

Since different waste types j are prevented from disposal, the amount of different waste types

$(W_{j,x})$ to be determined through sampling and the calculation of the mean from the samples, is calculated as follows;

$$W_{j,x} = W_x \cdot \frac{\sum_{n=1}^z p_{n,j,x}}{z}$$

W_x = Total amount of organic waste prevented from disposal in the year x (tonnes/year)

$p_{n,j,x}$ = Weight fraction of the waste type j in the sample n collected during the year x

z = Number of samples taken during the year x

The verification team has cross-checked the values from the Daily waste receipt register, waste characterization report /19/ with the ER Calculation spreadsheets /1/ for the period from 12/04/2010 to 30/04/2012. The conservative values are used for emission reductions calculation. The verified values are shown in the following Table 1.1 below.

Item/Period	12/04/2011 - 30/04/2012	19/04/2011- 30/04/2012						
	CPA1	CPA2	CPA3	CPA4	CPA5	CPA6	CPA7	CPA8
Waste Inflow (t/MSW)	54837	9976	15597	8276	7879	19550	13414	10706
CH4 generated (t CO2)	12903	1745	2718	1585	1493	3724	2489	2095
CH4 generated (t CH4)	614	83	129	75.44	71	177	119	100

CH ₄ generated (m ³ CH ₄)	627333	115742	180546	105250	99154	247385	165326	139210
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Table 1.1: Baseline calculation parameters

[Project emissions]

The project activity involves aerobic decomposition of organic fraction of municipal solid wastes resulting in avoidance of methane emissions that would have otherwise been emitted to the atmosphere from the organic matter left to decay anaerobically in a solid waste disposal site. Hence, according to AMS III F Methodology, the project emissions, PE_y is calculated as;

$$PE_y = PE_{y,transp} + PE_{y,power} + PE_{y,phy\ leakage} + PE_{y,comp} + PE_{y,runoff} + PE_{y,res\ waste}$$

PE_{y, transp} – Emissions from incremental transportation in year y (tCO₂e)

PE_{y, power} – Emissions from electricity or fossil fuel consumption in the year y (tCO₂e)

PE_{y, phy leakage} - methane emissions from physical leakages of the anaerobic digester in year y (tCO₂e)

PE_{y, comp} - methane emissions during composting process in the year y (tCO₂e)

PE_{y, runoff} - methane emissions from runoff water in the year y (tCO₂e)

PE_{y, res waste} - methane emissions from the anaerobic decay of the residual waste/products (tCO₂e)

The emission reductions from incremental transportation, PE_{y, transp}, is calculated as;

$$PE_{y,transp} = (Q_y / CT_y) * DAF_w * EF_{CO_2} + (Q_{y,treatment,i} / CT_{y,treatment,i}) * DAF_{treatment,i} * EF_{CO_2}$$

where

Q_y = Quantity of raw waste treated in the year “y” (tonnes)

CT_y = Average truck capacity for waste transportation (tonnes/truck)

DAF_w = Average incremental distance for raw solid waste (km/truck)

EF_{CO₂} = CO₂ emission factor from fuel use due to transportation (kgCO₂ /km)

Q_{y,comp} = Quantity of final compost product produced in the year “y” (tonnes)

CT_{y,comp} = average truck capacity for final compost product transportation (tonnes/truck)

DAF_{comp} = average distance for final compost product transportation (km/truck)

The verification team has cross-checked the values from the Daily outgoing compost register and compost sales receipts with the ER Calculation Spreadsheet values (Ref: /7/) for the period from 12/04/2010 to 30/04/2012. The conservative values are used for emission reductions calculation. The verified values are shown in the following Table 1.2 below.

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Parameter	UoM	CPA1	CPA2	CPA3	CPA4	CPA5	CPA6	CPA7	CPA8
$Q_{y,comp}$	ton	903.59	1803.9	745.77	117.25	84.61	431	460.75	319.57
$CT_{y,comp}$	ton/Truck	4.73	5.99	5.01	2.93	0.52	5.02	4.15	4.05
DAF_{comp}	Km/truck	12.79	11.04	8.28	15	16.03	8.87	20.86	6.43
EF_{CO2}	kg/CO2/km	0.545	0.545	0.545	0.545	0.545	0.545	0.545	0.545
$PE_{y,transp}$	tCO2e	29	15.8	16.82	8.28	35	10	32	6.93

Table 1.2: Project calculations parameters, incremental transportation

Emissions from electricity or fossil fuel consumption in the year y (tCO2e), $PE_{y,power}$ is calculated as;

$$PE_{power} = PE_{electricity} + PE_{fuel, onsite}$$

$$PE_{electricity} = MWh_e * CEF_{elec}$$

Where,

MWh_e = Amount of electricity consumed from the grid in the project activity, measured using and electricity meter.

CEF_{elec} = Carbon emissions factor for electricity generation(tCO2e/MWh) calculated for 2010

$$CEF_{elec} = \sum EF_m * EG_{m,2010} / \sum EG_{m,2010}$$

Where

EF_m = Emission factor for fuel m in tCO2/MWh

$EG_{m,2010}$ = Total energy generated using fuelbm in 2010

The verification team has cross-checked the values from the ER Calculation Spreadsheet (Ref: /7/), Monitoring report (Ref: /6/) and AMS I.D version 13(Ref: /15/) with the Uganda in figures, 2013 by Uganda Bureau of Statistics (Ref: /18/) for the period from 12/04/2010 to 30/04/2012. The conservative values are used for emission reductions calculation. The verified values are shown in the following Table 1.3 below.

Parameter	UoM	CPA1	CPA2	CPA3	CPA4	CPA5	CPA6	CPA7	CPA8
MWh_e	MWh	5.46	0.003	0	0	0	0.228	0	0
CEF_{elec}	tCO2e/MWh	0.2884	0.2884	0.2884	0.2884	0.2884	0.2884	0.2884	0.2884
$PE_{electricity}$	tCO2e	1.57	0.001	0	0	0	0.07	0	0

Table 1.3: Project calculations parameters, electricity consumption

Project emissions for electricity consumption, $PE_{fuel, onsite}$ is calculated as follows;

$$PE_{fuel, onsite} = F_{cons} * EF_{fuel}$$

Where

F_{cons} = Fuel consumption in(Litres)

EF_{fuel} = Emission factor of the fuel (kgCO₂/Litre)

The verification team has cross-checked the values from the fuel purchasing receipts and invoices with the values on ER Calculation Spreadsheet (Ref: /7/) for the period from 12/04/2010 to 30/04/2012. The conservative values are used for emission reductions calculation. The verified values are shown in the following Table 1.4 below.

Parameter	UoM	CPA1	CPA2	CPA3	CPA4	CPA5	CPA6	CPA7	CPA8
$F_{\text{cons, y}}$	Litres	10745	3506	5280	2219	1684	3350	3083	2534
EF_{fuel}	kgCO ₂ /Litre	2.727	2.727	2.727	2.727	2.727	2.727	2.727	2.727
$PE_{\text{fuel, onsite}}$	tCO ₂ e/yr	29	9.56	14.40	6.05	5	9	8	6.91

Table 1.4: Project calculations parameters, Fossil fuel consumption

Methane emissions during composting process in the year y (tCO₂e), $PE_{y, \text{comp}}$ is calculated as

$$PE_{\text{comp}} = Q * EF_{\text{composting}} * GWP_{\text{CH}_4}$$

Where,

$EF_{\text{composting}}$ = Methane emission factor of composting waste taken at 4kg methane/to wet waste treated

The verification team has cross-checked the values from the Daily waste receipt register, registered PoA DD (Ref: /1/) and IPCC Fourth Assessment Report: Climate Change 2007 with the ER Calculation Spreadsheet (Ref: /7/) for the period from 12/04/2010 to 30/04/2012. The conservative values are used for emission reductions calculation. The verified values are shown in the following Table 1.5 below.

Parameter	UoM	CPA1	CPA2	CPA3	CPA4	CPA5	CPA6	CPA7	CPA8
Q	ton	52592	8985.13	14733	7937	7483.55	18786	12793.85	10312.87
$EF_{\text{composting}}$	Kg CH ₄ /ton	4	4	4	4	4	4	4	4
GWP_{CH_4}	tCO ₂ e/tCH ₄	21	21	21	21	21	21	21	21
PE_{comp}	tCO ₂ e	4418	754.75	1237.54	666.72	629	1578	1075	866.28

Table 1.5: Project calculations parameters, Methane emissions during composting

Methane emissions from runoff water in the year y (tCO₂e), $PE_{y, \text{runoff}}$ is calculated as,

$$PE_{y, \text{runoff}} = Q_{y, \text{ww, runoff}} * COD_{y, \text{ww, runoff}} * B_{o, \text{ww}} * MCF_{\text{ww, treatment}} * UF_b * GWP_{\text{CH}_4}$$

Where

$Q_{y,ww,runoff}$ = Volume o run-off water (m3)

$COD_{y,ww,runoff}$ = Chemical demand of run-off water leaving the composting facility(gm/m3)

$B_{o,ww}$ = Methane producing capacity of waste water taken at IPCC default value of 0.25 kg.kg COD

$MCF_{ww,treatment}$ = Methane correction water for waste water treatment plant as per table III F.1 in the methodology III.F/version 06

UF_b = Model correction factor to account for uncertainties default of 1.06

GWP_{CH4} = Global warming potential of methane

The verification team has cross-checked the values from the Daily waste receipt register, approved leachate production rate/unit of fresh waste (Ref: /4/ & /13/), Waste characterization report (Ref: /19/) and registered PoA DD (Ref: /1/) with the ER Calculation Spreadsheet values (Ref: /7/) for the period from 12/04/2010 to 30/04/2012. The conservative values are used for emission reductions calculation. The verified values are shown in the following Table 1.6 below.

Parameter	UoM	CPA1	CPA2	CPA3	CPA4	CPA5	CPA6	CPA7	CPA8
$Q_{y,ww,runoff}$		3314.59	907.84	1419.29	753.07	716.94	1779.03	1220.64	974.29
$COD_{y,ww,runoff}$	g/m3	2727	2259	2114	2268	2693	2755	2628	2553
$B_{o,ww}$	kg/kg COD	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
$MCF_{ww,treatment}$		0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
UF_b		1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
GWP_{CH4}		21	21	21	21	21	21	21	21
$PE_{y,runoff}$	tCO2e	15	3.42	5.01	2.85	3.22	8.18	5.36	4.15

Table 1.6: Project calculations parameters, Methane emissions from run off water

Methane emissions from the anaerobic decay of the residual waste/products of composting operations, $PE_{y, res waste}$ is calculated using the equation below as per the tool to determine emissions avoided from disposal of waste at the solid waste disposal site(Ref:/12/)

$$BE_{CH4,SWDS,y} = \phi \cdot (1-f) \cdot GWP_{CH4} \cdot (1-OX) \cdot \frac{16}{12} \cdot F \cdot DOC_f \cdot MCF \cdot \sum_{x=1}^y \sum_j W_{j,x} \cdot DOC_j \cdot e^{-k_j(y-x)} \cdot (1 - e^{-k_j})$$

The quantity and composition of waste in the equation corresponds to the residual waste

The verification team has cross-checked the values from the fuel purchase invoices and receipts, electricity meter readings for the sites connected with grid power, with the the ER Calculation Spreadsheet values (Ref: /7/) for the period from 12/04/2010 to 30/04/2012. The conservative values are used for emission reductions calculation. The verified values are shown in the following Table 1.7 below.

Parameter	UoM	CPA1	CPA2	CPA3	CPA4	CPA5	CPA6	CPA7	CPA8
Fuel used in Equipment		29	9.56	14.40	6.05	5	9	8	6.91
Electricity consumption		1.57	0.001	0	0	0	0.07	0	0
Transport of waste		0		0	0	0	0	0	0
Transport of compost		27	15.8	16.82	8.28	35	10	32	6.93
Methane from composting		4418	754.75	1237.54	666.72	629	1578	1075	866.28
Emission from run off		15	3.42	5.01	2.85	3	8	5	4.15
Emission from residuals		468	69.17	26.77	5.77	8	25	65	12.63
Project Emissions		4959	853	1301	690	680	1632	1186	897

Table 1.7: Project calculations parameters, methane emissions from anaerobic decomposition of residual waste

[Leakage emissions]

According to the methodology applied, if the project technology is the equipment transferred from another activity or if the existing equipment is transferred to another activity, leakage effects are to be considered (LEy). During site visit, the verification team, through observation and interview with the project management confirmed that there are no transfers of equipment to other project activities or from other project activities. Hence, consideration by PP as leakage is considered, $L_y = 0$

[Emission reductions]

From the calculations in the ER Calculation Spreadsheet (Ref: /7/) and as cross checking of the individual parameters as stated in table 1.1 to 1.7 above, the emission reductions during the monitoring period from 12/04/2010 to 30/04/2012 are calculated as:

$$ER_y = BE_y - PE_y - L_y = 28,747 - 12,198 - 0 = 16,549 \text{ tCO}_2\text{e}$$

Type		CPA1	CPA2	CPA3	CPA4	CPA5	CPA6	CPA7	CPA8	Total
BE	tCO ₂ e	12903	1745	2717	1584	1492	3723	2488	2095	28747
PE	tCO ₂ e	4959	853	1301	690	680	1632	1186	897	12198
LE	tCO ₂ e	0	0	0	0	0	0	0	0	0

ER	tCO ₂ e	7944	892	1416	894	812	2091	1302	1198	16549
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Table 1.8: Baseline, Project, Leakage Emissions and emission reductions.

[Comparison of ERs]

The total annual estimated emission reductions for CPA 1 are 13,944 tCO₂e as per the registered PDD. The total actual operation days of the Project in the monitoring period are 620 days (For 2 years). The corresponding estimate in the monitoring period are 11,843 (= 13,944 * 620/730) tCO₂e. The actual emission reductions are 15.1 % less than the estimated value in the monitoring period.

The total annual estimated emission reductions for CPA 2 are 5258 tCO₂e as per the registered PDD. The total actual operation days of the Project in the monitoring period are 296 days. The corresponding estimate in the monitoring period are 4,264 (= 5258 * 296/365) tCO₂e. The actual emission reductions are 18.9 % less than the estimated value in the monitoring period.

The total annual estimated emission reductions for CPA 3 are 2235 tCO₂e as per the registered PDD. The total actual operation days of the Project in the monitoring period are 320 days. The corresponding estimate in the monitoring period are 1,959 (= 2235 * 320/365) tCO₂e. The actual emission reductions are 12.3 % less than the estimated value in the monitoring period.

The total annual estimated emission reductions for CPA 4 are 2535 tCO₂e as per the registered PDD. The total actual operation days of the Project in the monitoring period are 259 days. The corresponding estimate in the monitoring period are 1799 (= 2535 * 259/365) tCO₂e. The actual emission reductions are 29.0 % less than the estimated value in the monitoring period..

The total annual estimated emission reductions for CPA 5 are 5002 tCO₂e as per the registered PDD. The total actual operation days of the Project in the monitoring period are 281 days. The corresponding estimate in the monitoring period are 3851 (= 5002 * 281/365) tCO₂e. The actual emission reductions are 23.0 % less than the estimated value in the monitoring period.

The total annual estimated emission reductions for CPA 6 are 4929 tCO₂e as per the registered PDD. The total actual operation days of the Project in the monitoring period are 314 days. The corresponding estimate in the monitoring period are 4240(= 4929 * 314/365) tCO₂e. The actual emission reductions are 14.0 % less than the estimated value in the monitoring period.

The total annual estimated emission reductions for CPA 7 are 5090 tCO₂e as per the registered PDD. The total actual operation days of the Project in the monitoring period are 305 days. The corresponding estimate in the monitoring period are 4253 (= 5090 * 305/365) tCO₂e. The actual emission reductions are 16.4 % less than the estimated value in the monitoring period.

The total annual estimated emission reductions for CPA 8 are 4731 tCO₂e as per the registered PDD. The total actual operation days of the Project in the monitoring period are 313 days. The corresponding estimate in the monitoring period are 4057 (= 4731 * 313/365) tCO₂e. The actual emission reductions are 14.2 % less than the estimated value in the monitoring period.

The variation is due to the fact that most CPAs in the PoA did not operate in all 365 days/year at the design capacity and it is deemed to be reasonable.



- ✌ Corresponding to the paragraph 291 of VVS version 07.0, Bureau Veritas Certification can confirm that:
- Data used for the determination of the emission reductions are available and monitored in accordance with the monitoring plan contained in the approved revised PDD.
 - For unavailable data, appropriate actions were taken to ensure that the most conservative assumption theoretically possible has been made.
 - Information and data provided in the monitoring report have been cross-checked with other sources such as plant logbooks, inventories, purchase records, laboratory analysis.
 - Appropriate methods and formulae for calculating baseline emissions, project emissions and leakage have been followed.
 - Assumptions, emission factors and default values that were applied in the calculations have been justified.



4. VERIFICATION OPINION

Bureau Veritas Certification has performed the 1st periodic verification of Uganda Municipal Waste Compost Programme, CDM Registration Reference Number 2956, which is located in Uganda, and applying the methodology AMS III.F Version 06. The verification was performed based on the requirements set by the CDM and relevant guidance provided by CMP and the CDM Executive Board.

The verification consisted of the following three phases: i) desk review of the project design, the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion.

The management of International Bank for Reconstruction and Development as the Trustee of the community Development Carbon Fund(CDCF) is responsible for the preparation of the GHG emissions data and the reported GHG emission reductions of the project on the basis set out within the monitoring plan contained in the approved revised PDD. The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of GHG emission reductions from the project, is the responsibility of the management of the project.

Bureau Veritas Certification has verified the project Monitoring Report version 04 dated 13/08/2014 for the reporting period as indicated below. Bureau Veritas Certification confirms that the project is implemented as described in the approved revised project design documents. Installed equipments being essential for generating emission reductions run reliably. The monitoring system is in place and the Project is generating GHG emission reductions as a CDM project.

Bureau Veritas Certification can confirm that the GHG emission reductions are calculated without material misstatements. Our opinion relates to the projects' GHG emissions and resulting GHG emission reductions reported and related to the validated and registered project baseline, approved revised monitoring plan and its associated documents. Based on the evidence and information that are considered necessary to guarantee that GHG emission reductions are appropriately calculated, Bureau Veritas Certification confirms the following statement:

Reporting period:	12/04/2010 to 30/04/2012
Baseline emissions:	28,747 t CO ₂ equivalents
Project emissions:	12,198 t CO ₂ equivalents
Leakage emissions:	0 t CO ₂ equivalents
Emission Reductions:	16,549 t CO ₂ equivalents

Mr. Bhavesh Prajapati
Internal Technical Reviewer
22/08/2014

Mr. James Chirchir
Team Leader
22/08/2014

5. REFERENCES

Documents reviewed:

- /1/ Registered PDD version 1.6 dated 24/06/2009, UNFCCC ref no. 2956
- /2/ Revised PDD Version 1.8 dated 12/05/2014
- /3/ Validation Report revision 01, dated 05/04/2010
- /4/ Assessment Opinion on the Changes, Report No.Version 2 Dated 13/05/2014
- /5/ Monitoring Report version 01, dated 27/02/2013
- /6/ Monitoring Report version 04, dated 13/08/2014
- /7/ ER Calculation Spreadsheet version 02, dated 11/07/2014
- /8/ AMS III.F Version 06 dated 02/08/2008
- /9/ CDM Validation and Verification Standard Version 07.0 dated 01/06/2014
- /10/ CDM Operations and Monitoring Manual dated May 2013
- /11/ Internal Training Records and Qualification Certificate of Operation Staff.
- /12/ Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site version 4
- /13/ Email confirmation on approval of PRC 2956-01 dated 18/06/2014
- /14/ Calibration Certificates
- /15/ AMS I.D Grid Connected Renewable electricity generation version 13
- /16/ Internal Training Records and Qualification Certificate of Operation Staff
- /17/ Electricity Regulatory Authority Presentation at Geothermal conference, 2013
- /18/ Uganda in figures, 2013 by Uganda Bureau of Statistics.
- /19/ Waste Characterization report by Makerere University.
- /20/ Municipal waste composting Project for Fort Portal Municipality CPA-DD version 01
- /21/ Municipal waste composting Project for Soroti CPA-DD version 01
- /22/ Municipal waste composting Project for Mukono Municipality CPA-DD version 01
- /23/ Municipal Waste Composting Project for Mbarara, version 01
- /24/ Municipal waste composting Project for Mbale Municipality CPA-DD version 01
- /25/ Municipal waste composting Project for Lira Municipality CPA-DD version 01
- /26/ Municipal Waste Composting Project for Kasese Municipality, CPA-DD version 01
- /27/ Municipal Waste Composting Project for Kabale Municipality, CPA-DD version 01
- /28/ Municipal waste composting Project for Jinja Municipality, CPA-DD version 01
- /29/ Daily waste receipt registers
- /30/ Clean development mechanism project standard version 07.0

Persons interviewed:

- International Bank for Reconstruction and Development as the Trustee of the community Development Carbon Fund(CDCF)
- /1/ Mr. Sergio Degener World Bank Consultant
 - /2/ Ms Zijun Li Carbon Finance specialist
 - /3/ Ms Claudia Barrera Carbon Finance specialist

VERIFICATION REPORT


**BUREAU
VERITAS**

	National Environmental Management Authority (NEMA)	
/4/	Dr. Gerald Sawula	Deputy, Executive Director NEMA
/5/	Mr. Richard Mugabwa	Project Manager, NEMA
/6/	Mr. Dan Kiguli	Project Manager, NEMA
/7/	Mugyendesa Beddah	Site Manager, Kabale CPA
/8/	Ezra Nansasha	Data Clerk, Kabale CPA
/9/	Dr. Ruhemurana	Mayor, Kabale Municipality
/10/	Fiona Nakitende	Site Manager, Kasese CPA
/11/	Ithungu Annet	Data Clerk, Kasese, CPA
/12/	Kabbyaya G	Mayor, Kasese Municipality
/13/	Natugonza Gladys	Environment Officer, Fort Portal
/14/	Lwanga Edward	Town Clerk, Fort Portal Municipality
/15/	Mr. James Biryabarema	Site Manager, Fort Portal CPA
/16/	Bagenda A	Data Clerk, Fort Portal CPA
/17/	Ahimbisibwe Innocent	Town Clerk, Mukono Municipality
/18/	Kirumira Ssaziri	Tractor Driver, Mukono CPA
/19/	Masengere George	Project Coordinator, Mukono CPA
/20/	Namuli Margret	Data Clerk, Mukono CPA
/21/	Nakayiza Safinah	Site Manager, Mukono CPA
/22/	Nabihamba Ernest	Environment Officer, Jinja CPA
/23/	Oluka Martin	Data Clerk, Jinja CPA
/24/	Akurut Melda	Weighbridge Clerk, Engaano Millers
/25/	Ayoo Joyce	Data Clerk, Mbale CPA.
/26/	Sakwa Anthony	Supervisor, Mbale CPA
/27/	Namutamba Zanubia	Deputy Mayor, Mbale Municipality
/28/	Ekaju Dennis	Data Clerk, Soroti CPA
/29/	Engulu Eric	Environment Officer, Soroti
/30/	Akello Sharon	Site Supervisor, Lira CPA
/31/	Aplo Florence	Data Clerk, Lira CPA
/32/	Otim Peter	Compost Plant Manager, Lira CPA
/33/	Abili Moses	Teacher, Otintom Pry School, Compost User.



6. CURRICULA VITAE OF THE DOE'S VERIFICATION TEAM MEMBERS

Mr. James Chirchir	Bureau Veritas Certification, Kenya	Team Leader, Climate Change Lead Verifier, Holds a Bachelor's degree in Chemical and Process Engineering and had 4 years experience in manufacturing before joining Bureau Veritas Certification. He is a Quality Management System, Environment Management System and Energy Management System Lead Auditor and a trained CDM Verifier. He has conducted at least 5 CDM projects.
Mr. Srinivasan Selvaraj	Bureau Veritas Certification, India	Team Member, Climate Change Verifier. He is a graduate in B.TECH - Chemical Engineering, M.E (Environmental Management) and PGDBM (Finance). He has over 9 years of experience in the field of Environment and Energy management services including detailed design engineering and preparation of Detailed Project Reports, environmental and social assessment reports, Environmental management plans for urban infrastructure and industrial projects. He is a certified energy auditor from Bureau of Energy efficiency, Ministry of Power and has successfully completed the IRCA approved Lead Auditor course for Environmental Management System. He has been in the validation and verification of CDM/VCS/Gold standard projects since June 2008.
Mr. Bhavesh Prajapati	Bureau Veritas Certification, India	Technical Reviewer, Climate Change Lead Verifier. He is graduate in the field of Chemical Engineering and post-graduate in Finance (MBA- Finance). He has more than 8 years of Industrial work experience in the field of environment audits, consultancy of HVAC (pharmaceutical industry as well as commercial air conditioning) and utility services and project management of various green field as well as gray field projects. He has more than 4 years of experience in designing and executing various pharmaceutical projects in both formulation and API



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		manufacturing. He has undergone lead verifier's training on Clean Development Mechanism. He is also lead verifier for GHG accounting as per ISO 14064. He is involved in the Validation and Verification of more than 40 CDM and VCS projects.
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APPENDIX A: CDM PROJECT VERIFICATION PROTOCOL

Table 1 Verification requirements based on VVS version 07.0 (EB 79), PS version 07.0(EB 79), PCP version 07.0 (EB 79), and Guidelines for completing the Monitoring Report Form version 04.0 (EB 79)

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
Part I Cover Page					
(a) Does the CME prepare a single monitoring report (i.e. one document) containing all monitoring results of all CPAs included in the PoA, clearly separating the monitoring results of individual CPAs, as well as grouping the monitoring results by CPA type defined by the relevant generic CPA-DD?	PS	281(b)	Yes. The CME has prepared a single monitoring report for the PoA, providing results for each of the 8 CPAs included in the POA.	OK	OK
(b) Have all CPAs that shall consider for verification been identified in accordance with the method/procedure determined in the PoA-DD?	VVS	350(a)	All the CPAs included in the PoA have been verified during this monitoring period	OK	OK
(c) Which version of PoA-DD does the CPA comply with?	VVS	350(b)	The CPAs included in this verification period comply with version 1.8 of the PoA DD	OK	OK
(d) Is the title of the CPA provided?	MR		Yes. The titles for the CPAs are: CPA 1: Municipal waste composting Project for Jinja Municipality CPA 2: Municipal waste composting Project for Fort Portal Municipality CPA 3: Municipal waste composting Project for Kabale	OK	OK



VERIFICATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			Municipality CPA 4: Municipal waste composting Project for Kasese Municipality CPA 5: Municipal waste composting Project for Lira Municipality CPA 6: Municipal waste composting Project for Mbale Municipality CPA 7: Municipal waste composting Project for Mukono Municipality CPA 8: Municipal waste composting Project for Soroti Municipality		
(e) Is the reference number of the CPA provided?	MR		The reference numbers for the CPAs are CPA 2956-0001 CPA 2956-0002 CPA 2956-0003 CPA 2956-0004 CPA 2956-0005 CPA 2956-0006 CPA 2956-0007 CPA 2956-0008	OK	OK
(f) Is the version number of the monitoring report indicated?	MR		The monitoring report is version 4	OK	OK
(g) Is the completion date of the monitoring report provided in DD/MM/YYYY format?	MR		Yes. The date is provided as 03/07/2014	OK	OK



CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
(h) Are the registration date of the PoA and the inclusion date of the CPA provided in DD/MM/YYYY format?	MR		Yes. The registration date for the PoA is 12/04/2010. The inclusion date for CPA 1 is 12/04/2010 The inclusion date for CPA 2 – CPA 8 is 19/04/2011	Ok	OK
(i) Are the monitoring period number and duration of this monitoring period (first and last days included in DD/MM/YYYY format) provided?	MR		Yes. For CPA 1, the dates are : 12/04/2010 – 30/04/2012 while for CPA 2 to CPA 8, the dates are : 19/04/2011 – 30/04/2012	OK	OK
(j) Are project participants/CME indicated?	MR		Yes. The full list of the project participants has been included in pg 1 of the monitoring report.	Ok	OK
(k) Is the host party(ies) indicated?	MR		Yes. The host party is Uganda	Ok	OK
(l) Are the sectoral scope(s) and applied methodology(ies) indicated?	MR		Yes. The sectoral scope is 13 and the methodology is AMS-III.F.ver.6 – Avoidance of methane emissions through controlled biological treatment of biomass.	Ok	OK
(m) Is the estimated amount of GHG emission reductions or net anthropogenic GHG removals	MR		Yes. The estimated GHG emission reduction for each CPA is:	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
by sinks for this monitoring period in the registered PoA/CPA-DD indicated?			CPA 2956-0001: 7,053 CPA 2956-0002: 5,258 CPA 2956-0003: 2,235 CPA 2956-0004: 2,535 CPA 2956-0005: 5,002 CPA 2956-0006: 4,929 CPA 2956-0007: 5,090 CPA 2956-0008: 4,731		
(n) Are the actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period indicated?	MR		Yes. The actual GHG emission reduction for each CPA is: CPA 2956-0001: 7,944 CPA 2956-0002: 892 CPA 2956-0003: 1,416 CPA 2956-0004: 894 CPA 2956-0005: 812 CPA 2956-0006: 2,091 CPA 2956-0007: 1,302 CPA 2956-0008: 1,198	Ok	OK
(o) Are the actual GHG emission reductions or net anthropogenic GHG removals by sinks	MR		N/A. The monitoring period is up to 30 th April 2012	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
achieved during the period up to 31 December 2012 indicated (if applicable)?					
(p) Are the actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period from 1 January 2013 onwards indicated (if applicable)?	MR		N/A. The monitoring period is up to 30 th April 2012	OK	OK
Part II Monitoring Report					
A. Description of CPA					
A.1 Purpose and general description of CPA					
A.1.1 Is the description of the CPA to be presented in this section a brief summary of the detailed description given in the section B.1 Implementation status of the CPA?	MR		Yes.	Ok	OK
A.1.2 Does this description include:					
A.1.2.1 Purpose of the CPA and the measures taken for GHG emission reductions or net anthropogenic GHG removals by sinks?	MR		Yes. The purpose of the project activity is to avoid methane emissions from Municipal waste landfill by undertaking composting of organic municipal solid waste and using the organic matter in wastes as humus for soil conditioning and plant growth.	Ok	OK



CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
A.1.2.2 Brief description of the installed technology and equipments?	MR		The technology employed for waste management in the programme is the aerobic windrow based composting. The infrastructure provided for each CPA includes a barrier at the boundaries of the site and a gate for access control, windrow bays with a roof, an office block and Equipment such as tractor, wheel loader, temperature probe, a weighing scale and a simple set of sieves for compost sieving	OK	Ok
A.1.2.3 Relevant dates for the CPA (e.g. construction, commissioning, continued operation periods, etc.)?	MR		Yes. Section A.1 of the monitoring report provides these details.	Ok	OK
A.1.2.4 Total GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period?	MR		This has been stated in part 1(n) above	Ok	OK
A.2 Location of CPA					
A.2.1 Is the information on the location of the CPA provided, including Host Party(ies), Region/State/Province, City/Town/Community, Physical/Geographical location etc.?	MR		Yes. Section A.1 of the monitoring report provided these information for each CPA included in the PoA, to be reported during this monitoring period.	OK	Ok
A.3 Parties and project participant(s)					
A.3.1 Is the Party(ies) and project participant(s) involved in the CPA listed in the provided table?	MR		Yes. National Environment Management Authority (NEMA)- a Uganda Public Entity and International Bank of Reconstruction and Development as Trustee of the	Ok	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			Community Development Carbon Fund (CDCF) – Netherlands Public entity and the project participant have been listed.		
A.4 Reference of applied methodology					
A.4.1 Is the exact reference (number, title, version) of the methodology(ies) indicated?	MR		Yes. The methodology applied is correctly stated as AMS-III.F.ver.6 – Avoidance of methane emissions through controlled biological treatment of biomass	Ok	OK
A.4.2 Is the exact reference (number, title, version) of any tools and other methodologies to which the applied methodology(ies) refers indicated?	MR		Yes. The tools are listed as; “Tool to calculate baseline, project and/or leakage emissions from electricity consumption” version 01. “Tools to determine methane emissions avoided from disposal of waste at a solid waste disposal site” version 4.0. “Tool to calculate project or leakage CO2 emissions from fossil fuel combustion” version 02.	OK	OK
A.5 Crediting period of CPA					
A.5.1 Are the type, start date and length of the crediting period corresponding to this monitoring period provided?	MR		Yes. The details for the monitoring period are; CPA 1: 12/04/2010 – 11/04/2017 (Renewable) CPA 2 to CPA 8: 19/04/2011 – 18/04/2018 (Renewable)	OK	OK
B. Implementation of CPA					



CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
B.1 Description of implemented CPA					
B.1.1 Is the description of the installed technology, technical processes and equipments provided, include diagrams where appropriate?	MR PS	191(a)	<p>The technology employed for waste management in the programme is the aerobic windrow based composting.</p> <p>The infrastructure provided for each CPA includes a barrier at the boundaries of the site and a gate for access control, windrow bays with a roof, an office block and Equipment such as tractor, wheel loader, temperature probe, a weighing scale and a simple set of sieves for compost sieving.</p> <p>Section B.1 of the monitoring report has a detailed process description of each CPA and diagrammatic presentation of the process flow in composting process. This included waste receipt and measurements at the gate, pre-sorting of non-biodegradable wastes, windrow formation of the organic waste fraction of wastes and composting yard operations which includes temperature monitoring and periodic turning of wastes in windrows.</p>	OK	OK
B.1.2 Is the information on the implementation and actual operation of the CPA, including relevant dates (e.g. construction, commissioning, continued operation periods, etc.) provided?	PS	191(b)	<p>Yes. This programme of activities consists of 8 CPAs in different locations. The PP has described the status of implementation and start date of operation for each CPA, including the date of commissioning and operational days for this monitoring period in section B.1 of the monitoring period.</p> <p><i>In the registered PoA-DD, it is mentioned that all the compost plants are covered. However, the roofs are not seen in some of the compost plants (E.g., in LIRA</i></p>	CAR 03	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			<i>compost plants, the roofs for entire windrow bay 4, 5 and 6 are missing and a section of windrow 3 is damaged). In Jinja, a section of windrow no 3 and 4 are damaged – CAR 03</i>		
B.1.3 Is the description of: (i) the events or situations that occurred during the monitoring period that may impact the applicability of the methodology (ii) how the issues resulting from these events or situations have been addressed provided?	PS	191(c)	The PP has included a statement that there has not been any event during the monitoring period that affects the applicability of the methodology in any of the CPAs requesting emission reductions. No observation contrary to this statement was observed during site visit by the verification team.	OK	OK
B.1.4 Have the project participants addressed the FARs identified during validation or previous verification(s)?	VVS	258	The validation report indicate FAR 1 and FAR 2 which are to be resolved during 2nd stage validation stage and first verification stage. The status of these FARs has not been clarified in the MR	CL04	OK
B.1.5 Have the implementation and operation of the CPA been conducted in accordance with the description contained in the registered CPA-DD?	VVS	271	<p>Except for changes that have been requested for temporary deviation and permanent change which have since been approved by the Board (Ref: /4/ & /13/), implementation and operation of the CPAs have been conducted in accordance with the description contained in the registered CPA-DD.</p> <p>The verification team noted in Fort Portal CPA site that the produced compost was stored within the premises for more than 3 months. It is not clear to the team why this was the case and if any measurements are performed for such compost. Please clarify – CL 04</p> <p>The verification team noted in Mukono CPA that height</p>	CL04 CL05 CL06 CL07	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			<p>of windrow is over 4 meters in each of the bay. Please clarify how the aerobic conditions are maintained for the composting – CL 05</p> <p>During the site visit, the verification team noted that the one of the vehicles delivering incoming waste at Jinja CPA is a compactor, wherein the collected waste is compressed. It is not clear how the existing practice of measurement of volume of the waste is appropriate for this type of vehicle. Please clarify – CL 06</p> <p>The verification team observed that the roof of the windrow 3 of the compost pad is damaged by a storm in November 2012 and has been lying over the windrow pile since then at Lira CPA. It is not clear how the turning of windrows has happened within windrow 3 and between each windrow during the composting process. Please clarify – CL 07</p>		
B.1.6 Are all physical features of the project activity in the registered CPA-DD in place?	VVS	272	<p>Yes. The verification team conducted a site visit from 15th to 21st April 2013 and confirmed the existence of all physical features of the proposed project activity. These included the concrete composting pads with roof, leachate tanks, temperature monitoring probes, compost weighing scales, compost sieving equipment, electricity supply in some CPAs, compost turning wheel loader among others. Project database had also been maintained</p>	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl				
<table><tr><td>Facility/Equipment</td><td>Specification</td></tr><tr><td>Weighing Scale</td><td>Model: Hanson model 21 Type: Spring Capacity: 100 Kg S/N: Manufacturer: Hanson</td></tr></table>				Facility/Equipment	Specification	Weighing Scale	Model: Hanson model 21 Type: Spring Capacity: 100 Kg S/N: Manufacturer: Hanson		
Facility/Equipment	Specification								
Weighing Scale	Model: Hanson model 21 Type: Spring Capacity: 100 Kg S/N: Manufacturer: Hanson								
B.1.7 Have the project participants operated the CPA as per the registered CPA-DD or any approved revised CPA-DD?	VVS	272	Yes. The PP has operated the CPA as per approved revised CPA-DD	OK	OK				
B.1.8 Was an on-site visit conducted?	VVS	272	Yes. Site visit was conducted between 15/04/2013 and 21/04/2013.	Ok	OK				
B.1.9 If an on-site visit is not conducted, is the rationale of the decision justified?	VVS	272	N/A	-	-				
B.2 Post registration changes									
B.2.1 Temporary deviations from registered monitoring plan or applied methodology									
B.2.1.1 Is it indicated whether any temporary deviations have been applied during this monitoring period?	MR		Yes. Section B.2.1 of the monitoring report details the temporary deviation	Ok	OK				



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
B.2.1.2 Is a description of the deviation(s) in accordance with applicable provisions in the Project standard provided?	MR		Yes. The deviation is in accordance with applicable provisions in the Project standard provided.	Ok	Ok
B.2.1.3 Are the reasons for the deviation(s), how it deviates from the monitoring plan and/or applied methodology (ies), the duration for which the deviation(s) is(are) applicable and justification on the conservativeness of the approach included in the description?	MR		Yes. Section B.2.1 of the monitoring report details the deviation including reasons and justifications	OK	OK
B.2.1.4 For deviation(s) that require prior approval by the Board, are the date of approval and reference number included in the description?	MR		Yes. The reference number for post registration change is PRC-2956-001 which was approved by the Board on 16/06/2014.	Ok	OK
B.2.2 Corrections					
B.2.2.1 Is it indicated whether any corrections to project information or parameters fixed at validation have been approved during this monitoring period or submitted with this monitoring report?	MR		Yes. Section B.2.2 of the monitoring report has detailed the corrections effected during this monitoring period and which were approved by the Board on 16/06/2014.	Ok	Ok
B.2.2.2 In cases where the correction(s) and the revised PoA/CPA-DD are approved prior to the submission of this monitoring report for request for issuance, are the approval date and reference number provided? Otherwise,	MR		The approval date has been correctly provided as 16/06/2014 and the reference number is PRC-2956-001. Details are also provided in the link below: http://cdm.unfccc.int/PRCContainer/DB/prcp57211029/view	Ok	Ok



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
are the version number and the completion date of the revised PoA/CPA-DD provided?					
B.2.3 Permanent changes from registered monitoring plan or applied methodology					
B.2.3.1 Is it indicated whether any permanent changes from the registered monitoring plan or applied methodologies have been approved during this monitoring period or submitted with this monitoring report?	MR		Yes. Section B.2.3 of the monitoring report details items requested to be permanently changed, which was approved by the Board.	OK	OK
B.2.3.2 In cases where the change(s) and the revised PoA/CPA-DD are approved prior to the submission of this monitoring report for request for issuance, are the approval date and reference number provided? Otherwise, are the version number and the completion date of the revised PoA/CPA-DD provided?	MR		The approval date has been correctly provided as 16/06/2014 and the reference number is PRC-2956-001. Details are also provided in the link below: http://cdm.unfccc.int/PRCContainer/DB/prcp57211029/view	OK	Ok
B.2.4 Changes to project design of registered programme activities					
B.2.4.1 Is it indicated whether any changes to the project design of the PoA/CPA have been approved during this monitoring period or submitted with this monitoring report?	MR		N/A	-	-



VERIFICATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
B.2.4.2 In cases where the change(s) and the revised PoA/CPA-DD are approved prior to the submission of this monitoring report for request for issuance, are the approval date and reference number provided? Otherwise, are the version number and the completion date of the revised PoA/CPA-DD provided?	MR		N/A	-	-
B.2.5 Changes to start date of crediting period					
B.2.5.1 Is it indicated whether any changes to the start date of the crediting period have been approved during this monitoring period?	MR		N/A	-	-
B.2.5.2 In cases where the changes and the revised PoA/CPA-DD are approved prior to the submission of this monitoring report for request for issuance, are the approval date and reference number provided?	MR		N/A	-	-
B.2.6 Types of changes specific to afforestation or reforestation PoA					
B.2.6.1 Is it indicated whether any changes specific to afforestation or reforestation PoA have been applied during this monitoring period based on applicable	MR		N/A	-	-



VERIFICATION REPORT

CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
provisions in the Project standard that do not require prior approval by the Board?					
B.2.6.2 If changes were applied, are the version number and the completion date of the revised PoA/CPA-DD provided?	MR		N/A	-	-
C. Description of monitoring system					
C.1 General requirements					
C.1.1 Have project participants described the monitoring system and provided line diagrams (graphical schemes) showing all relevant monitoring points?	MR PS	193	Yes. The PP has provided information of monitoring system including graphical schemes in section C of the monitoring report.	OK	OK
C.1.2 Does this description where appropriate include data collection procedures (information flow including data generation, aggregation, recording, calculations and reporting), organizational structure, roles and responsibilities of personnel, and emergency procedures for the monitoring system?	MR PS	193	The PP has included a description of organizational structure and roles and responsibilities for data generation, aggregation, and reporting in section C of the monitoring report.	OK	OK
C.1.3 Is the monitoring plan of the CPA in accordance with the applied methodology	VVS	274	During the interview with the site personnel at Kasese CPA site, it was mentioned that they sell	CL-02	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
including applicable tool(s)?			unseived compost as well, based on the customer's specific requirements. It is not clear how the volume of rejects is determined in these cases. It is also not clear how the PP has ensured proper conditions and procedures are adhered to ensure aerobic conditions hence methane avoidance related to decomposition of these rejects. Please clarify? – CL 02		
C.1.4 For monitoring aspects that are not specified in the methodology, particularly in the case of small-scale methodologies (e.g. additional monitoring parameters, monitoring frequency and calibration frequency), are there any issues which may enhance the level of accuracy and completeness of the monitoring plan and should bring to the attention of the Board?	VVS	276	No.	-	-
C.1.5 Has the monitoring plan been properly implemented and followed by the project participants?	VVS	279(a)	In Fort Portal CPA, the verification team noted that the site for the compost plant is located within a low lying area, surrounded by a terrain which is sloping towards the compost pad on 3 sides. During the site visit, the verification team observed that run-off water (as a result of rain), traverse towards the compost pad from these surrounding terrain. Please clarify how the estimation of run-off water for the compost plant is conservative – CL	CL-03 CAR-02 CAR-04 CAR-05 CL-14 CL-13	OK



CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			<p>03</p> <p>The actual Monitoring procedure of estimation quantity of leachate (Use of Height of free board) is different from the procedure in the registered PoA-DD – CAR 02</p> <p>Aerobic conditions in composting process were monitored by measurement of oxygen in windrows using oxygen meters in all the CPA visited during verification site visit. However, Monitoring of oxygen had been excluded in the monitoring plan – CAR 04</p> <p>In Mukono CPA, based on the review of the documents and interview with the site operating personnel, the verification team noted that the Oxygen and Temperature measurements of the windrows have not happened between November 2012 and April 2013 – CAR 05</p> <p>While reviewing the primary data in the composting sites, the verification team noted that some density and waste composition data were missing for certain periods of time during the monitoring period. Please clarify how the determination of the parameter is conservative – CL 13</p> <p>It is not clear to the verification team if and how proper soil application of compost is being monitored by PP. Please clarify – CL 14</p> <p>Except for changes that have been requested for temporary deviation and permanent change which have since been approved by the Board, the monitoring plan</p>		



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			has been properly followed by the PP		
C.1.6 Have all parameters stated in the monitoring plan and relevant Board decisions been monitored and updated as applicable, including:	VVS	279(b)		-	-
C.1.6.1 Project emission parameters?	VVS	279(b)	Refer to Table 2 Monitoring Parameters checklist	-	-
C.1.6.2 Baseline emission parameters?	VVS	279(b)	Refer to Table 2 Monitoring Parameters checklist	-	-
C.1.6.3 Leakage parameters?	VVS	279(b)	Refer to Table 2 Monitoring Parameters checklist	-	-
C.1.6.4 Management and operational system: the responsibilities and authorities for monitoring and reporting are in accordance with the responsibilities and authorities stated in the monitoring plan?	VVS	279(b)	<p>The % of inerts considered for the calculation of Total quantity of organic waste prevented from disposal does not match with the background data – CL 08</p> <p>In Mukono CPA, based on the review of the documents and interview with the site operating personnel, the verification team noted that the Oxygen and Temperature measurements of the windrows have not happened between November 2012 and April 2013. – CAR5</p> <p>In Mbale site, the delivery of incoming waste happens in standard skips, whose dimensions (length and breadth) are pre-fixed and the volume of incoming waste for a particular skip is determined by measuring the height to which the incoming waste is filled in the particular skip. In Mbale CPA, while reviewing the register for recording</p>	CL-08 CAR5 CL-09 CL-11 CL-10 CL-12	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			<p>the daily volume of incoming waste, the verification team noted that for the truck (Reg No. UAJ 161X), whose dimensions (length and breadth) are fixed, there are different volumes arrived at for the same height of waste in the truck. Please clarify the difference. – CL 09</p> <p>The density of incoming waste is being determined based on the net weight (the difference of full load and free load of the vehicle) of on a monthly basis on a particular day. In Soroti CPA, while reviewing the records of density of incoming waste, the verification team noted that for the month of June 2011, the volume (of incoming waste in 2 skips), considered for determining the density does not match with the volume noted in the daily waste register for the same skips. Please clarify. – CL10</p> <p>In Soroti CPA, While reviewing the registers for oxygen measurements of compost windrows, it was not clear as on which dates the recordings are taken, as no date were provided for each of the recorded data. Please clarify – CL11</p> <p>In Lira CPA, in place of compost density, the density of incoming waste had been mentioned. Please clarify – CL12</p>		
C.1.7 Have the correct implementation and operation of the record-keeping system systematically been verified?	VVS	350(d)	<p><i>Yes. During site visit, the verification team reviewed hard copy records of fuel purchases including receipts and invoices, Daily waste receipts register, records of outgoing compost, waste characterization reports among others. It was evident that good record keeping system was in place.</i></p>	OK	Ok



CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
D. Data and parameters					
D.1 Data and parameters fixed ex ante or at renewal of crediting period					
D.1.1 For "Purpose of data", is one of the following options chose: (a) Calculation of baseline emissions or baseline net GHG removals by sinks; (b) Calculation of project emissions or actual net GHG removals by sinks; (c) Calculation of leakage?	MR		Options (a) and (b) have been chosen	OK	OK
D.1.2 For "Value(s) applied", if applicable, is one table used to report multiple values referring to the same data and parameter? If necessary, are reference(s) to electronic spreadsheets used?	MR		Yes.	Ok	Ok
D.1.3 Is the source of data provide and/or identified?	PS	195(d)	Yes. All data sources have been identified	Ok	Ok
D.1.4 Is information about appropriate emission factors, IPCC default values and any other reference values that have been used in the calculation of GHG emission reductions or net GHG removals provided?	PS	195(g)	Yes.	OK	OK
D.2 Data and parameters monitored					
D.2.1 For "Purpose of data", is one of the following options chose: (a) Calculation of baseline emissions or baseline net GHG	MR		Options (a) and (b) have been chosen	Ok	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
removals by sinks; (b) Calculation of project emissions or actual net GHG removals by sinks; (c) Calculation of leakage?					
D.2.2 For "Value(s) of monitored parameter", if applicable, is one table used to report multiple values referring to the same data and parameter? If necessary, are reference(s) to electronic spreadsheets used?	MR		Yes.	Ok	OK
D.2.3 Are the values of the monitored parameter for the purpose of calculating GHG emission reductions or net GHG removals provided? Where data are measured continuously, are they presented using an appropriate time interval? For default values (such as an IPCC value), where it is ex post confirmed, is the most recent value applied?	PS	195(a)	<i>Yes, but no parameters are measured continuously.</i>	OK	OK
D.2.4 Is the equipment used to monitor each parameter described, including details on accuracy class, and calibration information (frequency, date of calibration and validity), if applicable as per monitoring plan?	PS	195(b)	Yes. Weighing scales have been used in the measurement of outgoing composts. Calibration status for all weighing scales for the period 2011 to April 2012 could not be verified. Please clarify how the measurements resulting from the use of these scales are conservative – CL 15	CL 15	OK
D.2.5 Is the equipment used for monitoring is controlled and calibrated in accordance with	VVS	279(c)	Calibration status for all weighing scales for the period 2011 to April 2012 could not be verified. Please clarify	CL 15	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
the monitoring plan, the applied methodology, the Board guidance, local/national standards, or as per the manufacturer's specification?			how the measurements resulting from the use of these scales are conservative		
D.2.6 Is the calibration of those measuring equipments that have an impact on the claimed emission reductions conducted by the project participants at a frequency specified in the applied monitoring methodology and/or the monitoring plan?	VVS	237	As per CL 15 above	-	-
D.2.7 If, during verification of a certain monitoring period, the calibration has been delayed and the calibration has been implemented after the monitoring period in consideration (i.e. the results of delayed calibration are available), is the following conservative approach adopted in the calculation of emission reductions:	VVS	283	-	-	-
D.2.7.1 Applying the maximum permissible error of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration, if the results of the delayed calibration do not show any errors in the measuring equipment, or if the error is smaller than the maximum permissible error?	VVS	283(a)	As the calibration of the weighing scales was performed late, and following the VVS paragraph 283 a) on page 49 (VVS v.07.0, EB79) the maximal permissible errors have been applied conservatively to the calculations. Scanned copies of the calibrations, as well as the updated calculation spread sheet are being provided to the DOE. A technical descriptions of similar equipment provided, indicated an accuracy of +/- 0.5%, so 1% as applied is a conservative discount.	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
D.2.7.2 Applying the error identified in the delayed calibration test, if the error is beyond the maximum permissible error of the measuring equipment?	VVS	283(b)	N/A	-	-
D.2.7.3 Has the error has been applied:	VVS	284	-	-	-
D.2.7.3.1 In a conservative manner, such that the adjusted measured values of the delayed calibration shall result in fewer claimed emission reductions?	VVS	284(a)	Yes	Ok	OK
D.2.7.3.2 For all measured values taken during the period between the scheduled date of calibration and the actual date of calibration.	VVS	284(b)	Yes	Ok	OK
D.2.8 In cases where the results of the delayed calibration are not available, or the calibration has not been conducted at the time of verification, prior to finalizing verification, were the project participants requested to conduct the required calibration have the project participants calculated the emission reductions conservatively using the approach mentioned in item "D.2.7" above?	VVS	285	N/A	-	-
D.2.9 In cases where it is not possible for the project participants to conduct the	VVS	286	N/A	-	-



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
calibration at a frequency specified by either the applied methodology, guidance provided by the Board, and/or the registered monitoring plan due to reasons beyond the control of PPs, are the requirements for post registration changes, in section 9.5 of the VVS, followed?					
D.2.10 In cases where neither the monitoring methodology nor the monitoring plan specify any requirements for calibration frequency for measuring equipments, are the equipments calibrated either in accordance with the specifications of the local/national standards, or as per the manufacturer's specification? If neither local/national standards nor the manufacturer's specification are available, were international standards used?	VVS	242	N/A	-	-
D.2.11 Is it described how the parameters are measured/calculated and the measurement and recording frequency?	PS	195(c)	Yes. Section D.2 of the monitoring report has detailed information on how the parameters are measured/calculated and the measurement and recording frequency	OK	OK
D.2.12 Are monitoring results consistently recorded as per approved frequency?	VVS	279(d)	Yes, apart from the parameters whose request for temporary deviation was requested and approved by the Board.	Ok	Ok
D.2.13 Is the source of data (e.g. logbooks, daily	PS	195(d)	Yes.	Ok	Ok



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
records, surveys, etc.) provide and/or identified?					
D.2.14 Where relevant is the calculation method of the parameter provided?	PS	195(e)	Yes.	Ok	Ok
D.2.15 Are the QA/QC procedures applied described (if applicable per monitoring plan)?	PS	195(f)	Yes	Ok	Ok
D.2.16 Have quality assurance and quality control procedures been applied in accordance with the monitoring plan or the revised monitoring plan?	VVS	279(e)	Yes.	Ok	Ok
D.2.17 Is information about appropriate emission factors, IPCC default values and any other reference values that have been used in the calculation of GHG emission reductions or net GHG removals provided?	PS	195(g)	Where it is applicable, the PP has provide information on emission factors, IPCC default values and any other reference values. This was reviewed and confirmed by the verification team.	Ok	Ok
D.3 Implementation of sampling plan					
D.3.1 Is a description provided on how project participants implemented the sampling efforts and surveys for those data and parameters according to the sampling plan, Include:	MR		The PP in section D.3 of the monitoring report describes the implementation of the sampling plan during this monitoring period.	OK	Ok
D.3.1.1 Description of implemented sampling design?	MR		A sampling approach developed in the registered monitoring plan has been implemented.	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			<p>Weight Fraction of Waste type j in incoming waste sample, Weight Fraction of Waste type j in the residual waste sample and COD of run-off water are determined by sampling and analysis taken once every month by a third party, Makerere University Department of Agricultural Production.</p> <p>Density of fresh waste, density of residual waste, and density of compost are taken once every month by trained staff in each of the CPAs</p> <p>Other parameters determined through sampling are Aerobic conditions in compost use and Process monitoring (including measurement of temperature and moisture content)</p>		



CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
D.3.1.2 Collected data (electronic spreadsheets may be attached and referenced)?	MR		The PP has provided the verification team with electronic spreadsheets containing the collected and analyzed data obtained from the sampling plan implementation.	Ok	Ok
D.3.1.3 Analysis of the collected data?	MR		The PP has provided the verification team with electronic spreadsheets containing the collected and analyzed data obtained from the sampling plan implementation.	Ok	Ok
D.3.1.4 Demonstration on whether the required confidence/precision has been met?	MR		N/A	-	-
E. Calculation of emission reductions or GHG removals by sinks					
E.1 Calculation of baseline emissions or baseline net GHG removals by sinks					
E.1.1 Are the sample calculations for all formulae used and calculation of baseline emissions or baseline net GHG removals by sinks provided, applying actual values?	MR PS	197(a)	Yes. The PP has submitted to the verification team an excel spreadsheet which demonstrates application of the formulae used in the calculation of baseline emission reduction.	Ok	OK
E.1.2 Are the electronic spreadsheets to present full calculations in the monitoring report attached?	MR		Yes. An electronic spreadsheets to present full calculations has been provided. A number of cells in the Emission reduction calculation spreadsheets provided to the verification team by the PP refer to files/values which could not be verified. i. In Jinja waste inputs (B), the source of values for cell C43 & C44 could not verified (the calculation	CAR 06	Ok



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
			<p>approach is inconsistent with those of the other CPAs).</p> <p>ii. The source of values in cells D11(2442.3) and EA23(0.052) in Jinja 2010-12 Aggregate could not be verified.</p> <p>iii. The source of values in cells D11(82.64*3) in Fort Portal Agreegate sheet could not be verified</p> <p>iv. The source of values in cells C43 & C44 in Fort Portal Waste input sheet could not be verified</p> <p>v. The source data for values used in the calculation of Electricity consumption, Fuel efficiency of trucks, Compost produced and EF composting in ER calculator -All sheet could not be verified.</p> <p>From the reference provided, data from Kinyara Sugar works power plant (Biomass generated) is incorrectly indicated as electricity from hydropower plant. Similarly, Electro Maxx generates power from HFO and not Diesel. Please clarify</p> <p>Kindly note that where a value has been entered manually in the spread sheet(excluding values from monthly reports), the reference needs to be provided</p>		
E.2 Calculation of project emissions or actual net GHG removals by sinks					



CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
E.2.1 Are the sample calculations for all formulae used and calculation of project emissions or actual net GHG removals by sinks provided, applying actual values?	MR PS	197(b)	Yes. The PP has submitted to the verification team an excel spreadsheet which demonstrates application of the formulae used in the calculation of project emission reduction.	OK	Ok
E.2.2 Are the electronic spreadsheets to present full calculations in the monitoring report attached?	MR		Yes. An electronic spreadsheets to present full calculations has been provided	OK	OK
E.3 Calculation of leakage					
E.3.1 Are the sample calculations for all formulae used and calculation of leakage provided, applying actual values?	MR PS	197(c)	During site visit, the verification team, through observation and interview with the project management confirmed that there are no transfers of equipment to other project activities or from other project activities. Hence, leakage is considered zero, $L_y = 0$ as per the methodology applied.	OK	Ok
E.3.2 Are the electronic spreadsheets to present full calculations in the monitoring report attached?	MR		Yes. An electronic spreadsheet that presents full calculations has been provided. Leakage is however considered zero	OK	OK
E.4 Summary of calculation of emission reductions or net anthropogenic GHG removals by sinks					
E.4.1 Are the results of above sections summarized and GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period presented,	MR PS	197(d)	Yes. Section E.4 of the monitoring report has summarized results of above sections and GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period using the provided	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
using the provided table?			table.		
E.4.2 Is a complete set of data for the specified monitoring period is available?	VVS	290(a)	Partial data are not available because activity levels parameters have not been monitored in accordance with the registered monitoring plan. A request for deviation was submitted prior to submitting the request for issuance and approved by the Board on 16/06/2014 as per email confirmation (Ref: /13/).	Ok	Ok
E.4.3 Has information provided in the monitoring report been cross-checked with other sources such as plant log books, inventories, purchase records, laboratory analysis?	VVS	290(b)	Yes. The verification team has cross-checked the information provided in the monitoring report with others sources including daily outgoing compost register, compost sales receipts, fuel purchasing receipts and invoices, daily waste receipt register, waste characterization reports and electricity meter readings for sites connected with grid electricity among other published literature such as Uganda in Figures, by Uganda Bureau of Statistics	OK	Ok
E.4.4 Have calculations of baseline emissions, and project activity emissions and leakage, as appropriate, been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology document?	VVS	290(c)	Yes. The verification team has cross checked the calculation and confirms that they have been carried out in accordance with the formulae and methods described in the monitoring plan and the applied methodology	OK	OK
E.4.5 Have any assumptions used in emission calculations been justified?	VVS	290(d)	Yes. All leachate generated was assumed to be accumulated without use in composting for conservativeness.	OK	OK



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
E.4.6 Have appropriate emission factors, IPCC default values and other reference values been correctly applied?	VVS	290(e)	Yes	Ok	OK
E.5 Comparison of actual emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PoA/CPA-DD					
E.5.1 Is a comparison of actual GHG emission reductions or net anthropogenic GHG removal of the project activity achieved during this monitoring period with the estimates in the registered PoA/CPA-DD provided?	MR PS	198	Yes. The total annual estimated emission reductions for the CPAs are 36833 tCO ₂ e while the actual emission reductions achieved was 16550 tCO ₂ e for the same period. The actual emission reductions is less than the estimated emission reductions	Ok	Ok
E.6 Remarks on difference from estimated value in registered PoA/CPA-DD					
E.6.1 For any included CPAs, except A/R project activities, have project participants explained the cause of any increase in the actual GHG emission reductions achieved during the current monitoring period (e.g. higher water availability, higher plant load factor, etc.), including all information (i.e. data and/or parameters) that is different from that stated in the registered PoA/CPA-DD?	MR PS	199	There has not been any increase in the actual GHG emission reductions achieved during the current monitoring period hence no further explanations are provided.	Ok	OK
E.7 Actual emission reductions or net anthropogenic GHG removals by sinks					



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CHECKLIST QUESTION	Ref.	§	COMMENTS	Draft Concl	Final Concl
during the first commitment period and the period from 1 January 2013 onwards					
<p>E.7.1 If the monitoring period starts before 31 December 2012 and ends anytime thereafter, are actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved for the following two periods provided respectively?</p> <p>(a) Up to 31 December 2012 (1st commitment period);</p> <p>(b) From 1 January 2013 onwards.</p>	MR		<p>Yes. The actual emission reductions up to 31 December 2012 are as stated below;</p> <p>CPA1: 7,944</p> <p>CPA2: 892</p> <p>CPA 3: 1,416</p> <p>CPA 4: 894</p> <p>CPA 5: 812</p> <p>CPA 6: 2,091</p> <p>CPA 7: 1,302</p> <p>CPA 8: 1,198</p> <p>There are no emission reductions from 1 January 2013</p>	Ok	OK
<p>E.7.2 Is it ensured that the achieved GHG emission reductions or net anthropogenic GHG removals by sinks are calculated proportionally for each period? In cases where annual caps were applied in the calculations, is it ensured that the annual caps are pro-rated to each period?</p>	MR		Yes.	Ok	OK

**Table 2 Monitoring Parameters checklist**

Item	Information
Parameter ID	Fcons
Parameter description	Fuel consumption for equipment used in the composting process
Purpose of Data	<i>Project emissions</i>
Date Unit	Litres
Values of monitored parameter	As detailed in section 3.6 of this report
Values of ex-ante data	14600 l/yr
Source of data	<i>Fuel Purchase Records</i>
Monitoring frequency	Monthly
Recording frequency	Monthly
Calculation method (if applicable)	
Information flow	As detailed in section 3.6 of this report
Data Archiving	<i>Fuel purchasing records</i>
QA/QC Procedures (cross-check, double-check etc.)	Copies of the receipts of fuel purchased
Monitoring Instrument	Type: N/A Mode: Manufacturer: S/N: Accuracy:



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Item	Information
	Specific location: Period of Operating Time: Required Calibration frequency: Calibration Date/Validity: Calibration Entity:
Laboratory Analysis	Analyzed by: N/A Date of Analysis: Qualification of Analyzer:
Sampling	N/A
Additional Notes	

Item	Information
Parameter ID	Qycomp
Parameter description	Total quantity of compost produced and transported out of the site
Purpose of Data	<i>Project emissions</i>
Date Unit	Tonnes
Values of monitored parameter	As detailed in section 3.6 of this report
Values of ex-ante data	As per CPA DDs
Source of data	<i>Compost Production and Sales Register maintained by the operator</i>
Monitoring frequency	Daily



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Item	Information
Recording frequency	Daily
Calculation method (if applicable)	N/A
Information flow	As detailed in section 3.6 of this report
Data Archiving	<i>Compost Production and Sales Register</i>
QA/QC Procedures (cross-check, double-check etc.)	Calibration of weighing scale
Monitoring Instrument	Type: Spring scale Mode: No. 21 Manufacturer: Hanson S/N: - Accuracy: Specific location: Each CPA Period of Operating Time: 1 year Required Calibration frequency: Yearly Calibration Date/Validity: 13/9/2012 Calibration Entity: Uganda National Bureau of Standards
Laboratory Analysis	Analyzed by: N/A Date of Analysis: Qualification of Analyzer:
Sampling	N/A



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Item	Information
Additional Notes	N/A

Item	Information
Parameter ID	CTy,comp
Parameter description	Average truck capacity for transportation of compost
Purpose of Data	<i>Project emissions</i>
Date Unit	tonnes/truck
Values of monitored parameter	As detailed in section 3.6 of this report
Values of ex-ante data	6
Source of data	<i>Outgoing Compost Register maintained by the operator</i>
Monitoring frequency	Annually
Recording frequency	Calculated annually
Calculation method (if applicable)	Averages
Information flow	As detailed in section 3.6 of this report
Data Archiving	<i>Compost Production and Sales Register</i>
QA/QC Procedures (cross-check, double-check etc.)	Cross- check
Monitoring Instrument	Type: N/A Mode:



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Item	Information
	Manufacturer S/N: - Accuracy: Specific location: Period of Operating Time: Required Calibration frequency: Calibration Date/Validity: Calibration Entity:
Laboratory Analysis	Analyzed by:N/A Date of Analysis: Qualification of Analyzer:
Sampling	N/A
Additional Notes	N/A

Item	Information
Parameter ID	DAFcomp
Parameter description	Average distance for compost transportation to end users
Purpose of Data	<i>Project emissions</i>
Date Unit	Km



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Item	Information
Values of monitored parameter	As detailed in section 3.6 of this report
Values of ex-ante data	100
Source of data	<i>Outgoing compost registers maintained by the operator.</i>
Monitoring frequency	Daily
Recording frequency	Calculated annually
Calculation method (if applicable)	Averages
Information flow	As detailed in section 3.6 of this report
Data Archiving	<i>Outgoing compost registers</i>
QA/QC Procedures (cross-check, double-check etc.)	Cross check
Monitoring Instrument	Type: N/A Mode: Manufacturer: S/N: - Accuracy: Specific location: Period of Operating Time: Required Calibration frequency: Calibration Date/Validity: Calibration Entity:
Laboratory Analysis	Analyzed by:N/A



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Item	Information
	Date of Analysis: Qualification of Analyzer:
Sampling	N/A
Additional Notes	N/A

Item	Information
Parameter ID	MWhe,y
Parameter description	Amount of electricity consumed from the grid in the project activity
Purpose of Data	<i>Project emissions</i>
Date Unit	MWh
Values of monitored parameter	As detailed in section 3.6 of this report
Values of ex-ante data	2.92
Source of data	<i>Electricity meter and the bills from the power utility</i>
Monitoring frequency	Monthly
Recording frequency	Calculated annually
Calculation method (if applicable)	Averages
Information flow	As detailed in section 3.6 of this report



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Item	Information
Data Archiving	<i>Electricity meter readings and the power bills</i>
QA/QC Procedures (cross-check, double-check etc.)	Electricity consumption recorded at the plant shall be checked with power bills received from the power utility.
Monitoring Instrument	Type: Electricity meter readings Mode: DDS26D Manufacturer: S/N: UM 200829 /1600IMP/KWH(CPA 2) & U1065456 /1600IMP/KWH(CPA 6) Accuracy: +/- 1 (class 1) Specific location: Period of Operating Time: Required Calibration frequency: Calibration Date/Validity: Calibration Entity:
Laboratory Analysis	Analyzed by:N/A Date of Analysis: Qualification of Analyzer:
Sampling	N/A
Additional Notes	N/A



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Item	Information
Parameter ID	CEElectricity,
Parameter description	CO2 Emission Factor of the grid supplying electricity to the project
Purpose of Data	<i>Project emissions</i>
Date Unit	tCO2e/MWh
Values of monitored parameter	As detailed in section 3.6 of this report
Values of ex-ante data	0.14
Source of data	<i>Calculated as per AMS I D</i>
Monitoring frequency	Calculated annually
Recording frequency	Calculated annually
Calculation method (if applicable)	Calculated as per AMS I D
Information flow	As detailed in section 3.6 of this report
Data Archiving	<i>ER Calculator spreadsheet</i>
QA/QC Procedures (cross-check, double-check etc.)	
Monitoring Instrument	Type: N/A Mode: Manufacturer: S/N: - Accuracy: Specific location:



VERIFICATION REPORT

Item	Information
	Period of Operating Time: Required Calibration frequency: Calibration Date/Validity: Calibration Entity:
Laboratory Analysis	Analyzed by:N/A Date of Analysis: Qualification of Analyzer:
Sampling	N/A
Additional Notes	The data used in the calculation is obtained from the Uganda Electricity Regulatory Authority.

Item	Information
Parameter ID	EG m,y-1
Parameter description	Total annual electricity generation from Fuel m for the previous year supplied to the grid.
Purpose of Data	<i>Project emissions</i>
Date Unit	MWh
Values of monitored parameter	As detailed in section 3.6 of this report
Values of ex-ante data	As detailed in registered PoA DD
Source of data	<i>Uganda Electricity Transmission Company Limited</i>



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Item	Information
Monitoring frequency	Calculated annually
Recording frequency	Annually
Calculation method (if applicable)	
Information flow	As detailed in section 3.6 of this report
Data Archiving	
QA/QC Procedures (cross-check, double-check etc.)	
Monitoring Instrument	Type: N/A Mode: Manufacturer: S/N: - Accuracy: Specific location: Period of Operating Time: Required Calibration frequency: Calibration Date/Validity: Calibration Entity:
Laboratory Analysis	Analyzed by: N/A Date of Analysis: Qualification of Analyzer:



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Item	Information
Sampling	N/A
Additional Notes	The data used in the calculation is obtained from the Uganda Electricity Regulatory Authority.

Item	Information
Parameter ID	Qy,ww,runoff
Parameter description	Volume of run-off water in year y
Purpose of Data	<i>Project emissions</i>
Date Unit	m3
Values of monitored parameter	As detailed in section 3.6 of this report
Values of ex-ante data	0
Source of data	<i>Records of the compost plant</i>
Monitoring frequency	monthly
Recording frequency	monthly
Calculation method (if applicable)	
Information flow	As detailed in section 3.6 of this report
Data Archiving	<i>Records of monthly measurement</i>



VERIFICATION REPORT

Item	Information
QA/QC Procedures (cross-check, double-check etc.)	Cross-check by site manager
Monitoring Instrument	Type: Standard Measuring tape Mode: Manufacturer: S/N: - Accuracy: Specific location: Period of Operating Time: Required Calibration frequency: Calibration Date/Validity: Calibration Entity:
Laboratory Analysis	Analyzed by:N/A Date of Analysis: Qualification of Analyzer:
Sampling	N/A
Additional Notes	

Item	Information
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VERIFICATION REPORT

Item	Information
Parameter ID	COD_{y,ww},runoff
Parameter description	Chemical Oxygen demand of run-off water leaving the composting facility
Purpose of Data	<i>Project emissions</i>
Date Unit	Tonnes / m ³
Values of monitored parameter	As detailed in section 3.6 of this report
Values of ex-ante data	0.001621
Source of data	<i>Waste Characterization Reports</i>
Monitoring frequency	Monthly
Recording frequency	Monthly
Calculation method (if applicable)	
Information flow	As detailed in section 3.6 of this report
Data Archiving	<i>Waste Characterization Reports</i>
QA/QC Procedures (cross-check, double-check etc.)	Sample given to laboratories recognized by the government
Monitoring Instrument	Type: N/A Mode: Manufacturer: S/N: - Accuracy: Specific location:



VERIFICATION REPORT

Item	Information
	Period of Operating Time: Required Calibration frequency: Calibration Date/Validity: Calibration Entity:
Laboratory Analysis	Analyzed by: Makerere University Date of Analysis: Monthly Qualification of Analyzer: Competent
Sampling	N/A
Additional Notes	

Item	Information
Parameter ID	f
Parameter description	Fraction of methane captured at the SWDS and flared, combusted or used in another manner
Purpose of Data	<i>Project emissions</i>
Date Unit	Fraction
Values of monitored parameter	As detailed in section 3.6 of this report
Values of ex-ante data	0
Source of data	<i>Site visits to solid waste disposal sites in the corresponding municipality hosting the CPA</i>



VERIFICATION REPORT

Item	Information
Monitoring frequency	Annually
Recording frequency	Annually
Calculation method (if applicable)	
Information flow	As detailed in section 3.6 of this report
Data Archiving	
QA/QC Procedures (cross-check, double-check etc.)	
Monitoring Instrument	Type: N/A Mode: Manufacturer: S/N: - Accuracy: Specific location: Period of Operating Time: Required Calibration frequency: Calibration Date/Validity: Calibration Entity:
Laboratory Analysis	Analyzed by: N/A Date of Analysis: Qualification of Analyzer:



VERIFICATION REPORT

Item	Information
Sampling	N/A
Additional Notes	

Item	Information
Parameter ID	Wx
Parameter description	Total quantity of organic waste prevented from disposal in year x (tons)
Purpose of Data	<i>baseline emissions</i>
Date Unit	Tonnes
Values of monitored parameter	As detailed in section 3.6 of this report
Values of ex-ante data	0
Source of data	<i>Records of incoming waste and measurements at the facility</i>
Monitoring frequency	Daily, but calculated annually
Recording frequency	Daily
Calculation method (if applicable)	
Information flow	As detailed in section 3.6 of this report
Data Archiving	<i>Records of incoming waste and measurements</i>



VERIFICATION REPORT

Item	Information
QA/QC Procedures (cross-check, double-check etc.)	The data recorded may be cross checked with municipal record of waste disposal and payments for the same.
Monitoring Instrument	Type: N/A Mode: Manufacturer: S/N: - Accuracy: Specific location: Period of Operating Time: Required Calibration frequency: Calibration Date/Validity: Calibration Entity:
Laboratory Analysis	Analyzed by: N/A Date of Analysis: Qualification of Analyzer:
Sampling	N/A
Additional Notes	

Item	Information
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VERIFICATION REPORT

Item	Information
Parameter ID	P_{n,j,x}
Parameter description	Weight fraction of the waste type j in the incoming waste in sample n
Purpose of Data	<i>baseline emissions</i>
Date Unit	%
Values of monitored parameter	As detailed in section 3.6 of this report
Values of ex-ante data	As per registered PoA DD
Source of data	<i>Waste Composition Analysis</i>
Monitoring frequency	Monthly
Recording frequency	Monthly
Calculation method (if applicable)	
Information flow	As detailed in section 3.6 of this report
Data Archiving	<i>Waste Composition Analysis records</i>
QA/QC Procedures (cross-check, double-check etc.)	Results will be cross-checked by NEMA staff with those obtained during the same month for previous years.
Monitoring Instrument	Type: N/A Mode: Manufacturer: S/N: - Accuracy: Specific location:



VERIFICATION REPORT

Item	Information
	Period of Operating Time: Required Calibration frequency: Calibration Date/Validity: Calibration Entity:
Laboratory Analysis	Analyzed by: N/A Date of Analysis: Qualification of Analyzer:
Sampling	N/A
Additional Notes	

Item	Information
Parameter ID	Wx residual
Parameter description	Total quantity of residual organic waste landfilled in year x
Purpose of Data	<i>Project emissions</i>
Date Unit	Tonnes
Values of monitored parameter	As detailed in section 3.6 of this report
Values of ex-ante data	0



VERIFICATION REPORT

Item	Information
Source of data	<i>Compost plant outgoing records</i>
Monitoring frequency	Calculated annually from daily records for volume of residual wastes sent to landfill, and monthly records for density and composition analysis.
Recording frequency	Annually
Calculation method (if applicable)	
Information flow	As detailed in section 3.6 of this report
Data Archiving	<i>Compost plant outgoing records</i>
QA/QC Procedures (cross-check, double-check etc.)	Operations manual detailing the procedures are available on site, the NEMA officials carry out routine monitoring to verify these records.
Monitoring Instrument	Type: N/A Mode: Manufacturer: S/N: - Accuracy: Specific location: Period of Operating Time: Required Calibration frequency: Calibration Date/Validity: Calibration Entity:
Laboratory Analysis	Analyzed by: N/A Date of Analysis: Qualification of Analyzer:



VERIFICATION REPORT

Item	Information
Sampling	N/A
Additional Notes	

Item	Information
Parameter ID	P n,j,x, residual
Parameter description	Weight fraction of the waste type j in the residual waste sample n collected
Purpose of Data	<i>Project emissions</i>
Date Unit	%
Values of monitored parameter	As detailed in section 3.6 of this report
Values of ex-ante data	As per registered PoA DD
Source of data	<i>Monthly sampling and analysis of the residual waste stream</i>
Monitoring frequency	Composition analysis three times in three months.
Recording frequency	three times in three months.
Calculation method (if applicable)	
Information flow	As detailed in section 3.6 of this report
Data Archiving	<i>Waste Composition Analysis records</i>



VERIFICATION REPORT

Item	Information
QA/QC Procedures (cross-check, double-check etc.)	Results will be cross-checked by NEMA staff with those obtained during the same month for previous years.
Monitoring Instrument	Type: N/A Mode: Manufacturer: S/N: - Accuracy: Specific location: Period of Operating Time: Required Calibration frequency: Calibration Date/Validity: Calibration Entity:
Laboratory Analysis	Analyzed by: Makerere University Date of Analysis: three times in three months. Qualification of Analyzer: Competent
Sampling	N/A
Additional Notes	



APPENDIX B: RESOLUTION OF CORRECTIVE ACTION /CLARIFICATION /FORWARD ACTION REQUESTS

Draft report clarifications and corrective action requests by verification team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
<p><i>The validation report indicate FAR 1 and FAR 2 which are to be resolved during 2nd stage validation stage and first verification stage. The status of these FARs has not been clarified in the MR</i></p>	CL 01	<p><i>Since the registration of the PoA, 8 more CPAs have been included in the PoA and all of them have been mentioned in the PoA Letter of Approval issued by the Ugandan DNA. Please refer to the attachment 1.</i></p> <p><i>Therefore the FAR that was raised at validation makes reference to the new letter of approval that will be required for the inclusion of the following CPAs (10th CPA onwards), as the current letter only makes specific reference to the 9 which have already been included. This is stated on page 39 of the PoA Validation Report which says “the Letter of Approval details exactly the locations of several CPAs, so following CPAs will require a new Letter of Approval.”</i></p> <p><i>In addition, the validation report for all the included CPAs are also available at the UNFCCC website, under the link “view all CPAs” of the PoAs webpage. For instance, the Validation report for CPA-0002 is found following this link: http://cdm.unfccc.int/ProgrammeOfActivities/cpa_db/S_TBWL6QVOMX1FDK4Z57G3CA2UHN9Y19/view</i></p> <p><i>On page 11 of this specific report, it is explained that it</i></p>	<p>FAR 1 was requested regarding the validation of CPAs not approved by the DNA, which exclude the first 9 CPAs verified during these period. Hence, FAR 1 is not applicable for this period of verification. CL 01 is closed out.</p>



VERIFICATION REPORT

Draft report clarifications and corrective action requests by verification team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
		<i>has been validated that the CPA meets all requirements of the host country DNA. The same explanation is part of all the validation reports for the other 8 CPAs.</i>	
<i>During the interview with the site personnel at Kasese CPA site, it was mentioned that they sell unseived compost as well, based on the customer's specific requirements. It is not clear how the volume of rejects is determined in these cases. It is also not clear how the PP has ensured proper conditions and procedures are adhered to ensure aerobic conditions hence methane avoidance related to decomposition of these rejects. Please clarify?</i>	CL 02	<i>The rejects are not sorted out from compost by individual farmers after purchasing, and the unseived compost is then used for land application as fertilizer directly. Considering the thin layers being applied at the surface of land, the aerobic conditions are ensured hence no methane is generated from decomposition of the rejects.</i>	The response provided by PP has been reviewed and found plausible by the verification team; CL 02 is thus closed out.
<i>In Fort Portal CPA, the verification team noted that the site for the compost plant is located within a low lying area, surrounded by a terrain which is sloping towards the compost pad on 3 sides. During the site visit, the verification team observed that run-off water (as a result of rain), traverse towards the compost pad from these surrounding terrain. Please clarify how the estimation of run-off water for the compost plant is</i>	CL 03	<i>The estimation of run-off water volume is based on the conservative default factor found in literature (as stated in CAR 2) for the first monitoring period. Figure of 0.07 m3/ton of waste is used. It is more conservative than the maximum volume it could generate.</i> <i>In addition the PP will address this concern by setting up a drainage system to divert the rain water from run-off water especially during the rainy seasons.</i>	CL 03 is closed out. However, FAR 04 is raised for the review of drainage system for rain water in the next verification



VERIFICATION REPORT

Draft report clarifications and corrective action requests by verification team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
<i>conservative.</i>		<i>Instruction is being given in the operational manual.</i>	
<i>The verification team noted in Fort Portal CPA site that the produced compost was stored within the premises for more than 3 months. It is not clear to the team why this was the case and if any measurements are performed for such compost. Please clarify.</i>	CL 04	<p><i>Part of the regular operations at the sites is to have compost used/given away or applied without it being stored on site. This was evidenced at most of the sites, as this is the marketing strategy to change the negative perception locals have of compost derived from MSW, and building a demand for it through demonstration activities. The demonstration gardens were shown to the DOE at all sites, and the use of it on municipal landscaping was explained. What was noted at For Portal is therefore not the common practice, and was the result of the site wanting to have it ready to be sold for customers as they arrive, but it has been explained to the site operator that this should not happen, and they should be applying it to the gardens or giving it away in order to continue building the future demand.</i></p> <p><i>The PP would also like to note that as this situation is new, it will be corrected at the operational level, but will not have an effect over credits being claimed on this monitoring period being verified.</i></p>	The proposed actions on way forward for Fort Portal CPA is acceptable to the verification team. CL 04 is closed out.
<i>The verification team noted in Mukono CPA that height of windrow is over 4 meters in each of the bay. Please clarify how the aerobic conditions are maintained for the</i>	CL 05	The fluctuation of operating performance in Mukuno is due to the change of on-site staff in early 2013 and the site was operating with no supervision of site manager for the period of February 2013 to May 2013.	The proposed actions on way forward for Fort Portal CPA is acceptable to the verification team. CL 04 is



VERIFICATION REPORT

Draft report clarifications and corrective action requests by verification team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
<i>composting</i>		With a new site manager on board, the plant operation has returned to normal and monitoring has been carried out according to the manual and registered plan.	closed out.
<i>During the site visit, the verification team noted that the one of the vehicles delivering incoming waste at Jinja CPA is a compactor, wherein the collected waste is compressed. It is not clear how the existing practice of measurement of volume of the waste is appropriate for this type of vehicle. Please clarify.</i>	CL 06	<p>The new vehicle has been operating since early 2013.</p> <p>Standard volume is calculated for the new skip type and is followed in monitoring records from the start date of the use of this new vehicle.</p> <p>In order to be compliant with the monitoring plan, a change will be introduced on the revised MP to include provisions on how to monitor volume of collected waste when it comes from compactors.</p>	The proposed revision of the monitoring plan is acceptable to the verification team, CL 06 is closed out.
<i>The verification team observed that the roof of the windrow 3 of the compost pad is damaged by a storm in November 2012 and has been lying over the windrow pile since then at Lira CPA. It is not clear how the turning of windrows has happened within windrow 3 and between each windrow during the composting process. Please clarify.</i>	CL 07	<p>The turning of windrow 3 was suspended during the roof damage. The specific quantity of the affected windrow will be excluded from calculation of emission reductions in the corresponding monitoring period.</p> <p>Operation of Lira plant is expected to return to</p>	The proposed action is considered acceptable by the verification team; CL 07 is thus closed out. However, FAR 05 is raised for review of the actions proposed in the next verification circle.



VERIFICATION REPORT

Draft report clarifications and corrective action requests by verification team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
		normal operations once the roof is fixed on August 2013.	
<i>The % of inerts considered for the calculation of Total quantity of organic waste prevented from disposal does not match with the background data</i>	CL 08	The % of inerts were included as part of the input information on the calculation spread sheet; all data from the characterization reports is now included in the excel sheet so the values for inerts can be easily crosschecked. Please refer to the updated spread sheet.	The updated spreadsheet was crossed checked and found OK, CL 08 is closed out.
<i>In Mbale site, the delivery of incoming waste happens in standard skips, whose dimensions (length and breadth) are pre-fixed and the volume of incoming waste for a particular skip is determined by measuring the height to which the incoming waste is filled in the particular skip. In Mbale CPA, while reviewing the register for recording the daily volume of incoming waste, the verification team noted that for the truck (Reg No. UAJ 161X), whose dimensions (length and breadth) are fixed, there are different volumes arrived at for the same height of waste in the truck (e.g volume of wastes on 17/4/2013(6.8 M³) compare to 1/6/2011(6 M³) for 1.6m height). Please</i>	CL 09	<p>The PE confirms that this is due to a typo due to difference reference of standardized dimensions was applied. Volume of incoming waste for the indicated truck is corrected in daily/monthly and aggregated sheets. (Reg No. Uxxx27.031)</p> <p>The values for waste income were corrected for Mbale. All volume calculations for the mentioned truck were crosschecked and corrected whenever required, using the manually collected data.</p>	The updated spreadsheet was crossed checked and found OK, CL 09 is closed out.



VERIFICATION REPORT

Draft report clarifications and corrective action requests by verification team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
<i>clarify the difference.</i>			
<i>The density of incoming waste is being determined based on the net weight (the difference of full load and free load of the vehicle) of on a monthly basis on a particular day. In Soroti CPA, while reviewing the records of density of incoming waste, the verification team noted that for the month of June 2011, the volume (of incoming waste in 2 skips), considered for determining the density does not match with the volume noted in the daily waste register for the same skips. Please clarify</i>	CL 10	The volume of incoming waste in the 2 skips on for the month of June 2011 has been corrected on the referred record. It has negligible impact on ER calculation.	The updated spreadsheet was crossed checked and found OK, CL 10 is closed out.
In Soroti CPA, While reviewing the registers for oxygen measurements of compost windrows, it was not clear as on which dates the recordings are taken, as no date were provided for each of the recorded data. Please clarify.	CL 11	It refers to the oxygen data for the period January to April 2013. Correction has been made and monitoring procedure for oxygen parameter has been added into operational manual.	The revised procedure was reviewed and is deemed sufficient to address the gap, CL 11 is closed out.
In Lira CPA, in place of compost density (0.992 t/m ³), the density of incoming waste(1.21 t/m ³) had been used in the calculation of bulk compost sale as per records of register of daily outgoing	CL 12	Corrections have been made to the compost density values. We would like to point out that this value is not	CL 12 is closed out based on PPs response.



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Draft report clarifications and corrective action requests by verification team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
composts for 8 th , 9 th and 18 th April 2013. Please clarify.		involved in the ER calculations, and therefore has no effect on credits being claimed.	
While reviewing the primary data in the composting sites, the verification team noted that some density and waste composition data were missing for certain periods of time during the monitoring period. Please clarify how the determination of the parameter is conservative	CL 13	<p>Due to financial constraints at both municipality and CME level, the contracts for conducting the monthly composition analysis were delayed and only in place for the period March 2011 to February 2012.</p> <p>For the missing months during this first monitoring period, considering that: i) waste composition is not expected to have a significant variation as it is being collected from the same places with the same population, and ii) the seasonal variation and completeness of analysis data in subsequent monitoring periods; the PP proposes to draw the waste composition figures from analysis of next two months during the first monitoring period, namely May and June 2013 (attachment 6).</p> <p>Figures of May and June 2013 are applied in the ER sheet accordingly.</p>	CL 13 is closed out based on PPs response.



VERIFICATION REPORT

Draft report clarifications and corrective action requests by verification team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
It is not clear to the verification team if and how proper soil application of compost is being monitored by PP. Please clarify.	CL 14	<p>As it is mentioned on the Monitoring Plan of the PDD, the PP conducts sample surveys of the compost users. For this monitored period these were completed in 5 municipalities and were provided to the DOE.</p> <p>During the site visit, the record of purchasers of compost was maintained and provided to DOE for spot check. A random sampling was done and the use of compost was assessed by DOE by visiting a couple of buyers who were properly applying compost.</p>	Sample surveys of the compost users in 5 municipalities were reviewed during verification site visit, CL 14 is closed out.
Calibration status for all weighing scales for the period 2011 to April 2012 could not be verified. Please clarify how the measurements resulting from the use of these scales are conservative	CL 15	As the calibration of the weighing scales was performed late, and following the VVS paragraph 283 a) on page 49 (VVS v.07.0, EB79) the maximal permissible errors have been applied conservatively to the calculations. Scanned copies of the calibrations, as well as the updated calculation spread sheet are being provided to the DOE.	The references provided to the DOE has reviewed, and found acceptable. CL 15 is closed out.
The actual Monitoring procedure of estimation quantity of leachate (Use of Height of free board) is different from the procedure in the registered PoA-DD	CAR 02	<p>During the implementation phase, reality demonstrated that the approved monitoring approach is not practical as there are difficulties in emptying the leachate tank once a month; therefore CPA plants were not able to follow this approach.</p> <p>For the first monitoring period an alternative approach</p>	During the site visit, the new site manager was introduced to the verification team. CL 05 is closed out. However, FAR 06 is raised for the review of site operations in



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Draft report clarifications and corrective action requests by verification team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
		<p>is suggested, based on available information in literature (Attachment 3) where it is indicated that leachate production in composting ranges from a daily rate 0.03-0.07m³ per ton of waste. The alternative conservative approach suggested to be applied by the PP, is to consider that all the leachate generated is accumulated, and further the higher daily rate of 0.07m³ per ton of waste for project emissions from this source. Therefore to determine the total leachate generated, the daily rate is multiplied by the total waste delivered to the site for this monitoring period.</p> <p>A request for deviation for the monitoring plan is therefore suggested for the current monitored period, and for future ones the revision of the monitoring plan will be submitted to reflect the change of practice in leachate monitoring.</p>	compliance with the manual and registered plan in the next verification circle.
In the registered PoA-DD, it is mentioned that all the compost plants are covered. However, the roofs are not seen in some of the compost plants (E.g., in LIRA compost plants, the roofs for entire windrow bay 4, 5 and 6 are missing and a section of windrow 3 is damaged). In Jinja, a section of windrow no 3 and 4 are damaged	CAR 03	<p>As it was explained on site, the damaged roofs in Jinja were caused by storms in February 2013 and the damage in Lira were caused by two strong storms in the monsoon season of 2012, therefore having no impact over the current monitoring period being verified.</p> <p>Evidence is provided on the start date of damage and estimated date for completion for repairing</p>	Evidence on communication in respect to the repair work for the damaged roofs were reviewed and found satisfactory. CAR 03 is thus closed out. However, FAR 03 is raised for verification of corrective actions being implemented by the project



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Draft report clarifications and corrective action requests by verification team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
		(Attachment 4 and 5).	implementers.
Aerobic conditions in composting process were monitored by measurement of oxygen in windrows using oxygen meters in all the CPA visited during verification site visit. However, Monitoring of oxygen had been excluded in the monitoring plan	CAR 04	Monitoring of oxygen was actually included as part of Annex 4 of the registered CPA-DD. The missing records for the oxygen parameter during the first monitoring period are due to the delayed procurement of the equipment. In order to account for this the PP suggests to submit a request of deviation to tackle this issue. Monitoring of the Oxygen parameter is being followed as per the operational manual since August 2012, after the arrival of oxygen meters on site.	Request for deviation by the PP was approved by the Executive Board, CAR 04 is thus closed out.
In Mukono CPA, based on the review of the documents and interview with the site operating personnel, the verification team noted that the Oxygen and Temperature measurements of the windrows have not happened between November 2012 and April 2013.	CAR 05	As it was explained above, the monitoring situation at Mukono is due to the change of operating staff at the site, having an effect on monitored data for the year 2013 which is outside of this monitoring period being verified. The situation has been identified and actions have been taken to make sure records are being resumed since April 2013.	Based on the explanation provided by the PP, Car 05 is closed out. However, FAR 06 is raised for the review of site operations in compliance with the manual and registered plan in the next verification circle. Refer to FAR 06 below.
A number of cells in the Emission reduction calculation spreadsheets	CAR 06	The excel calculation sheet has been updated, now including the values from the monthly reports. This	Refer to the listed comments



Draft report clarifications and corrective action requests by verification team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
<p>provided to the verification team by the PP refer to files/values which could not be verified.</p> <ul style="list-style-type: none"> i. In Jinja waste inputs (B), the source of values for cell C43 & C44 could not verified(the calculation approach is inconsistent with those of the other CPAs). ii. The source of values in cells D11(2442.3) and EA23(0.052) in Jinja 2010-12 Aggregate could not be verified. iii. The source of values in cells D11(82.64*3) in Fort Portal Agreegate sheet could not be verified iv. The source of values in cells C43 & C44 in Fort Portal Waste input sheet could not be verified v. The source data for values used in the calculation of Electricity consumption, Fuel efficiency of trucks, Compost produced and EF 		<p>allows the DOE to crosscheck the monthly values with the total values used to calculate the emission reductions achieved.</p> <p><u>Respond to second request raised by the DOE:</u></p> <ul style="list-style-type: none"> i. The calculation approach has been corrected, the source of information is now traceable within the excel sheet. ii. The calculation in the excel sheet was corrected. The value 0.052 was a mistake by entering the input value. iii. The formula has been corrected. iv. The source of the input values in now traceable in the ER calculation sheet. <p>The source of the values are indicated in the excel sheet.</p> <p>The errors have been corrected.</p>	<ul style="list-style-type: none"> i. The revised value cross-checked and found OK. ii. The revised value cross-checked and found OK iii. Reviewed and found OK iv. Reference for Uganda Electricity Regulatory Authority has been cross-checked and the calculations are OK. <p>Based on the above reviews, CAR 06 is closed out.</p>



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Draft report clarifications and corrective action requests by verification team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
<p>composting in ER spread sheets - All sheet could not be verified.</p> <p>Kindly note that where a value has been entered manually in the spread sheet(excluding values from monthly reports), the reference needs to be provided</p> <p>From the reference provided, data from Kinyara Sugar works power plant (Biomass generated) is incorrectly indicated as electricity from hydropower plant. Similarly, Electro Maxx generates power from HFO and not Diesel. Please clarify.</p>			
Repair works on roof for Lira and Jinja CPAs to be reviewed for implementation and close out in the next verification	FAR 03		To be evaluated during the next monitoring report
The project proponent has proposed to divert the rain water away from the composting pad at Port Fortal. The review of the drainage system to be done	FAR 04		To be evaluated during the next monitoring report



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Draft report clarifications and corrective action requests by verification team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
in the next verification			
The turning of windrow 3 was suspended during the roof damage at Lira CPA. The specific quantity of the affected windrow will be excluded from calculation of emission reductions in the corresponding monitoring period. The review of the actions proposed to be done in the next verification period.	FAR 05		To be evaluated during the next monitoring report
During the site visit, the new site manager for Mukono CPA was introduced to the verification team. CL 05 is closed out. However, FAR 06 is raised for the review of site operations in compliance with the manual and registered plan in the next verification circle.	FAR 06		To be evaluated during the next monitoring report

**APPENDIX B: SITE VISIT AGENDA: Uganda Municipal Waste Compost Programme – Uganda, UNFCCC Reference No: 2956****Site visit verification agenda****Objective**

To assess actual implementation of the project activity, cross check information used to calculate emissions reduction and interact with project stakeholders.

Site visit activities

Activity	Participants
1. Assessment of compost sales records	CPA Implementers - Municipalities National Environmental Management Authority (NEMA) International Bank for Reconstruction and Development as the Trustee of the community Development Carbon Fund(CDCF)
2. Assessment of leakage	CPA Implementers - Municipalities National Environmental Management Authority (NEMA) International Bank for Reconstruction and Development as the Trustee of the community Development Carbon Fund(CDCF)
3. Assessment of Daily waste receipts	CPA Implementers - Municipalities National Environmental Management Authority (NEMA) International Bank for Reconstruction and Development as the Trustee of the community Development Carbon



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	Fund(CDCF)
4. Assessment of Waste Characterisation records	National Environmental Management Authority (NEMA) International Bank for Reconstruction and Development as the Trustee of the community Development Carbon Fund(CDCF)
5. Interviews with compost Users	Users and Verification team

Assessment method

The assessment of records is based on random sampling. The verification team will employ acceptance sampling as described in CDM “Sampling and surveys for CDM project activities and programme of activities” version 04.0. The table below show the minimum sample size of records and interviews that will be assessed and the number of acceptable disparities between the records reported by PP and records that will be obtained by the verifiers:

Records/Interviews	Sample size	Acceptance number
Compost Sales records	8 samples for each CPA Implementer	0 discrepancies
Fuel records	8 samples for each CPA Implementer	0 discrepancies
Daily waste receipts records	8 samples for each CPA Implementer	0 discrepancies
Waste Characterisation records	8 samples	0 discrepancies

The sample size and acceptance number in the table above are based on all conditions below:



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- (a) Acceptable quality level or the Level of Assurance, i.e. the proportion of discrepancies between the PP sample records and the DOE sample records (i.e. DOE field/onsite inspection results) that are acceptable (AQL). AQL = 1%
- (b) The proportion of discrepancies between the PP sample record and DOE sample records that are unacceptable, (UQL). UQL = 20%
- (c) A 10% Producer's risk: That is a 10% chance that the DOE will wrongly reject the PPs records (i.e. reject a set of records of acceptable quality)
- (d) A 20% Consumer's risk: That is 20% chance that the DOE will wrongly accept the PPs records (i.e. accept a set of records which is unacceptable)