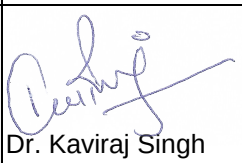
Verification and certification report form for CDM project activities

(Version 03.0)

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION	
Title and UNFCCC reference number of the project activity	Palmeras POME Co-composting Project UNFCCC ref. #: 8918
Scale of the project activity	☐ Large-scale ☒ Small-scale
Version number of the verification and certification report	1
Completion date of the verification and certification report	14/11/2019
Monitoring period number and duration of this monitoring period	1st Monitoring period 01/01/2013 to 31/05/2019 (both days included)
Version number of the monitoring report to which this report applies	3.0
Crediting period of the project activity corresponding to this monitoring period	Type: Renewable Start date: 01/01/2013, Length: 7 years
Project participants	Palmeras de la Costa S.A. Aretech Cambio Climático S.A.
Host Party	Colombia
Applied methodologies and standardized baselines	AMS-III.F. ver. 10.0 - Avoidance of methane emissions through composting
Mandatory sectoral scopes	Sectoral Scope 13 : Waste handling and disposal
Conditional sectoral scopes, if applicable	N/A
Estimated amount of GHG emission reductions or GHG removals for this monitoring duration in the registered PDD	228,149[1] tCO_2e
Certified amount of GHG emission reductions or GHG removals for this monitoring period	76,099 tCO_2e
Name and UNFCCC reference number of the DOE	Earthood Services Private Limited (ESPL) (ref E- 0066)
Name, position and signature of the approver of the verification and certification report	 Dr. Kaviraj Singh Managing Director

[1] This estimate was calculated based on the calculation considering 2,342 days of the monitoring period.

SECTION A. Executive summary

Brief summary of the project activity

The project activity developed in a 9,500 hectares palm plantation which is part of palm oil mill Palmeras de la Costa S.A.

The project activity consists in a co-composting project that avoids methane emissions from Palm Oil Mill Effluent (POME) anaerobic decay. The project replaces the anaerobic/aerobic treatment of Empty Fruit Bunches (EFB) and anaerobic treatment of POME by an aerobic composting process of EFB and POME. Only methane avoidance from POME treatment is accounted as baseline emissions in this PA.

The PA is located in the region of Cesar, Colombia.

The operation start date of the Co-composting plant was on 01/12/2012

Scope of verification

Palmeras de la Costa S.A. has contracted Earthood Services Private Limited to conduct the verification and certification of emission reductions reported for the CDM project activity “Palmeras POME Co-composting Project” for the period from 01/01/2013 to 31/05/2019 (including both days). Moreover, Earthood Services Private Limited will conduct the validation of Post Registration changes found during this monitoring period.
The verification is the periodic independent review and ex post determination of the monitored reductions in GHG emissions that have occurred due to the registered CDM project activity during the defined monitoring period.

The scope of the verification is to establish/verify that:

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

Verification process

The verification process involved following:

- Palmeras de la Costa S.A. for the scope of verification;
- publication of monitoring report;
- desk review;
- physical on-site inspection;
- issuance of verification findings;
- reporting, calculation checks, QA/QC and resolution of findings;
- issuance of draft verification report;
- independent technical review of the project documentation;

- issuance of the final verification report;
- submission of the request for issuance, as appropriate.

Conclusion

Earthood Services Private Limited has performed the verification of the CDM PA "Palmeras POME Co-composting Project", having UNFCCC Ref. Number 8918 for the period from 01/01/2013 to 31/05/2019. The verification team has confirmed the implementation of the project as per description in the revised PDD, the monitoring plan of the PDD and the application of the monitoring methodology (AMS-III.F ver 10.0). In addition, it was confirmed that the monitoring system is in place and the emission reductions are calculated without material misstatements.

The verified emission reductions amount to 76,099 tCO_2e in the above-mentioned monitoring period.

The verification team concluded that the registered CDM PA complies with all relevant CDM procedures/standards/guidance and therefore request for issuance is being submitted in accordance with the CDM procedures.

SECTION B. Verification team, technical reviewer and approver

B.1. Verification team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interviews	Verification findings
1.	Team Leader	OR	Sebben	Marcelo	Verifit	Y	Y	Y	Y
2	Technical Expert	OR	Sebben	Marcelo	Verifit	Y	Y	Y	Y
3	Methodological Expert	OR	Lopes	Ricardo	Verifit	Y	N	N	Y
4	Local Expert	OR	Lopes	Ricardo	Verifit	Y	N	N	Y

B.2. Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	Gautam	Ashok	Central Office
2	Technical Expert	IR	Gautam	Ashok	Central Office
3	Approver	IR	Singh	Kaviraj	Central Office

SECTION C. Application of materiality

C.1. Consideration of materiality in planning the verification

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	*Human error in recording the readings*	*Medium*	*Although some parameters are measured on-line with minimized possibility of errors, there are parameters that are measured manually either by External laboratory or by internal personnel*	*Check on readings procedure Check 100% of Laboratory Analysis Reports and 100% of manual readings. There are some parameters which only the number of positive results are available (parameter Q,y portion). Thus, even though more than 14000 samples were carried out, only the condition < or > 8% oxygen was reported.*
2.	*Error in transferring the data to ER sheet*	*Medium*	*Transfer of data from source to ER calculation involve human intervention and might lead to inconsistencies.*	*The values reported in ER sheet to be checked with their respective source data. The values for all parameters reported at the interval of were verified from the source data.*
3.	*Calculation of parameters*	*Low*	*Human errors entering formulas and data.*	*All formulas are checked and compared to applied methodology and tools. In addition, entry data are crosschecked with raw data.*

C.2. Consideration of materiality in conducting the verification

Not applicable as 100% of data was checked.

SECTION D. Means of verification

D.1. Desk/document review

A desk review was conducted by the verification team that included:

a. a review of the data and information presented to verify its completeness;

b. a review of the registered monitoring plan, the monitoring methodology including applicable tool(s) and, where applicable, the applied standardized baseline, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures;

c. an evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.

A complete list of documents/evidences reviewed is included as Appendix 3.

D.2. On-site inspection

Duration of on-site inspection: 16/07/2019 to 17/07/2019				
No.	**Activity performed on-site**	**Site location**	**Date**	**Team member**
1.	Opening Meeting: Introduction, scope and objective of work, roles and responsibilities of audit team, resources required, and timetable of the onsite audit including venue for closing meeting and any concerns from PP.	Palmeras de la Costa Palm Oil Mill	16/07/2019	Marcelo Sebben
2.	Implementation and operation of project activity (project boundary, technology, project equipment, monitoring and	Palmeras de la Costa Palm Oil Mill	16/07/2019	Marcelo Sebben

	metering equipment) as per registered PDD/previous verification.			
3.	- Management and monitoring procedures followed at project site.	Palmeras de la Costa Palm Oil Mill	16/07/2019	Marcelo Sebben
4.	Physical inspection of the project activity: Site visit and interview of monitoring personnel	Palmeras de la Costa Palm Oil Mill	16/07/2019	Marcelo Sebben
5.	Continuation: - Physical inspection of the project activity: Site visit and interview of monitoring personnel	Palmeras de la Costa Palm Oil Mill	16/07/2019 17/07/2019	Marcelo Sebben
6.	Management and operational system: Documentation, allocation of responsibilities, qualification and training, data recording &archiving, internal audit and management review and emergency procedures	Palmeras de la Costa Palm Oil Mill	17/07/2019	Marcelo Sebben
7.	Verification checklist: compliance of monitoring procedures followed at project site with registered PDD and monitoring methodology.	Palmeras de la Costa Palm Oil Mill	17/07/2019	Marcelo Sebben
8.	Review of monitored data and relevant document in accordance with registered monitoring plan and applied monitoring methodology.	Palmeras de la Costa Palm Oil Mill	17/07/2019	Marcelo Sebben
9.	Sampling procedures: - Application of adjustment in parameter BODinflow - Sampling of Qy for determining Qy,portion - Application of adjustment in parameter **$COD_{y,ww,runoff}$** Sampling results	Palmeras de la Costa Palm Oil Mill	17/07/2019	Marcelo Sebben
10.	Review of ER calculations in accordance with applied methodology and relevant tools.	Palmeras de la Costa Palm Oil Mill	17/07/2019	Marcelo Sebben
11.	Check of pending information Compilation of the audit findings.	Palmeras de la Costa Palm Oil Mill	17/07/2019	Marcelo Sebben
12.	Closing Meeting: Submission of the audit findings to the client and agreement on the issues raised and agreement on timelines.	Palmeras de la Costa Palm Oil Mill	17/07/2019	Marcelo Sebben

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Giraldo	Carlos	South Pole	16/07/2019 17/07/2019	MR, and ER calculations	Marcelo Sebben
2.	Chavez	Luis	Palmeras de la Costa	16/07/2019 17/07/2019	- Description of project activity. Physical Inspection of site. Monitored data – raw data	Marcelo Sebben
3.	Padilla	Gustavo	Palmeras de la Costa	16/07/2019	Management System	Marcelo Sebben
4.	Molina	Keyla	Palmeras de la Costa	17/07/2019	Monitored data – raw data	Marcelo Sebben

D.4. Sampling approach

Not applicable as no sampling has been used during the verification.

D.5. Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Compliance of the monitoring report with the monitoring report form			
Compliance of the project implementation and operation with the registered PDD			
Post-registration changes			
Compliance of the registered monitoring plan with the methodologies including applicable tools and standardized baselines			
Compliance of monitoring activities with the registered monitoring plan	CL 01 CL 02 CL 04 CL 04	CAR 01	
Compliance with the calibration frequency requirements for measuring instruments			
Assessment of data and calculation of emission reductions or net removals	CL 05 CL 06		
Assessment of reported sustainable development co-benefits			
Global stakeholder consultation			
Others (please specify)			
Total	6	1	0

SECTION E. Verification findings

E.1. Compliance of the monitoring report with the monitoring report form

Means of verification	The MR was crosschecked with the CDM-MR-FORM template available at the UNFCCC website and with the instructions for filling it out. Some inconsistencies were found. Refer to findings in the sections below.
Findings	N/A
Conclusion	A valid version of the verification template (CDM-MR-FORM – version 07.0) available at the UNFCCC website has been used. All sections were now completed in accordance with instructions for completing the MR.

E.2. Remaining forward action requests from validation and/or previous verifications

Means of verification	The validation report /23/ has been reviewed and it was observed that no FAR was open during the validation phase.

	No prior verifications occur as this is the 1st monitoring period.
Findings	N/A
Conclusion	No remaining FAR from validation phase were observed.

E.3. Compliance of the project implementation and operation with the registered project design document

Means of verification	During the on-site visit, the verification team checked the implementation status of the project activity as well as the monitoring equipment. In addition, interviews with personnel and PP's representatives were also performed. The project activity consists in a co-composting project that avoids methane emissions from Palm Oil Mill Effluent (POME) anaerobic decay. The project replaces the anaerobic/aerobic treatment of Empty Fruit Bunches (EFB) and anaerobic treatment of POME by an aerobic composting process of EFB and POME. Only methane avoidance from POME treatment is accounted as baseline emissions in this PA. The project's boundaries include the co-composting plant and the 9,500 hectares of Palm Oil Plantation The plant operation start date was on 01/12/2012.
Findings	N/A
Conclusion	According to information verified during the site visit, the verification team has confirmed that all physical features (technology, project equipment, and monitoring and metering equipment) of the PA were in place and are in accordance with the registered PDD. The plant was operated as per as the registered PDD.

E.4. Post-registration changes

E.4.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents[2]

Means of verification	During the current verification, some parameters were not monitored as per monitoring plan. Therefore, some findings were raised. Refer to Findings CL 04 and CAR 1.
Findings	*N/A*
Conclusion	During the current monitoring period six temporary deviations were requested. 1- Parameter $Q_{ww,y}$: between 25/08/15 to 31/05/19 the parameter was not duly monitored by the project participants. 2- Parameter $Q_{ww,runoff}$: between 25/08/15 to 31/05/19 the parameter was not duly monitored by the project participants. 3- Parameters BOD_{inflow} and $COD_{y,ww,runoff}$: between 01/01/2013 and 31/12/2015 the PP did not manage to conduct the minimum samples of BOD and COD as required by the MP. 4- Parameters BOD_{inflow} and $COD_{y,ww,runoff}$: between 01/01/2016 and 31/05/2019 both parameters were not monitored 5- Parameter EC_y: Between 01/01/2016 and 29/02/2016 this parameter was not monitored 6- Parameter Qy,portion: Between 01/01/2017 and 31/05/2019 no Oxygen analysis were conducted in the residues piles, thus, this parameter could not be monitored.

E.4.2. Corrections

Means of verification	No corrections were requested during this verification.

[2] Other standards, methodologies, methodological tools and guidelines (to be) applied in accordance with the applied(selected) methodologies are collectively referred to as the other (applied) methodological regulatory documents).

Findings	N/A
Conclusion	During the current monitoring period no corrections were needed. The operation of the project activity is in accordance with current version of the PDD.

E.4.3. Changes to the start date of the crediting period

Means of verification	No change to the start date of crediting period was requested during this verification.
Findings	N/A
Conclusion	The operation of the PA starter just before the start date of crediting period. Thus no change is needed.

E.4.4. Inclusion of a monitoring plan

Not applicable

E.4.5. Permanent changes from registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines or other

Means of verification	No permanent changes from registered MP were requested during this monitoring period.
Findings	N/A
Conclusion	During the current monitoring period no permanent changes of MP were needed. The operation of the project activity is in accordance with current version of the PDD.

E.4.6. Changes to the project design

Means of verification	No changes to the project design were requested during this monitoring period.
Findings	N/A
Conclusion	During the current monitoring period no permanent changes of MP were raised. The operation of the project activity is in accordance with current version of the PDD.

E.4.7. Changes specific to afforestation and reforestation project activities

Not applicable

E.5. Compliance of the registered monitoring plan with applied methodologies, applied standardized baselines, and other applied methodological regulatory documents

Means of verification	The MP of the registered PDD was reviewed against the monitoring requirements of the applied methodologies and applicable tools.
Findings	-
Conclusion	The MP of the project activity is totally in accordance with the applied methodology - AMS-III.F. - Avoidance of methane emissions through composting (version 10.0)- which also refers to the methodology AMS-III.H “Methane recovery in wastewater treatment” (version 16.0).

E.6. Compliance of monitoring activities with the registered monitoring plan

E.6.1. Data and parameters fixed ex ante or at renewal of crediting period

Means of verification	According to the registered PDD, the following parameters are fixed for the crediting period: - **$\eta_{BOD,BL}$: COD/BOD removal efficiency of the baseline treatment system.** As allowed by AMS III.H v16.0, the project activity uses BOD to determine the organic content of wastewater. The value applied is 0.939

	- **$MCF_{ww,treatment,}$: Methane correction factor for the wastewater treatment system in the baseline.** The value applied is 0.8 given by AMS III.H version 16.0 Table III.H.1 - **$B_{o,ww}$: Methane producing capacity for wastewater.** Value applied is 0.6 kg CH4/kg BOD given by AMS III.H version 16.0. - **UF_{BL}: Model correction factor to account for model uncertainties for wastewater.** The value applied is 0.89. - **$EF_{CO2,elec}$: Emission factor for electricity consumed:** The value applied is 1.3 tCO_2e/MWh. Value applied is default and given by Tool to calculate baseline, project and/or leakage from electricity consumption, version 01. - **$EF_{composting}$: Emission factor for composting of organic waste and/or manure.** The value applied is 0.004 tCH_4/ton waste treated. Value applied is default and given by AMS III.F version 10.0. - **$B_{o,ww,runoff}$: Methane producing capacity for wastewater.** Value applied is 0.25 kg CH4/kg COD given by AMS III.F version 10.0. - **$MCF_{ww,runoff,}$: Methane correction factor for the wastewater treatment system where the runoff water is treated.** The value applied is 0.2 given by AMS III.H version 16.0 Table III.H.1 - **$UF_{b,runoff}$: Model correction factor to account for model uncertainties for runoff.** The value applied is 1.12 as per AMS III.F version 10.0
Findings	N/A
Conclusion	All fixed parameters were included in the MR section D.1 and are in accordance with registered PDD or EB decisions.

E.6.2. Data and parameters monitored

Means of verification	All monitored parameters listed in MR used to calculate baseline and project GHG emissions of the PA were checked against the registered PDD. Some inconsistencies were found when describing the parameters in section D.2 of the MR. The parameters of the registered PDD were verified in order to check its consistency with CDM tools and guidance to ER calculations.

1. **$MD_{y,reg}$: Amount of methane that would have to be captured and combusted in the year y to comply with prevailing regulations**

Criteria/Requirements	Assessment Observation
Measuring / Reading / Recording frequency	This parameter is to be considered in case there are any local/national legislation that limits the GHG emissions. At the moment of the verification, no methane is to be captured to comply with prevailing regulations[23].
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes
Monitoring equipment	Not applicable
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does	Not applicable

the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Not applicable
Calibration frequency / interval	Not applicable
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Not applicable
Is the calibration of measuring equipment carried out by an accredited person or institution?	Not applicable
Is(are) the calibration(s) valid for the entire reporting period?	Not applicable
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Not applicable
How were the values in the monitoring report verified?	Research to applied legislation/23/
If applicable, has the reported data been crosschecked with other available data?	Confirmation made by Interviews with PPs.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	yes
In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by paragraph 231 b) the CDM Project Standard for PA–version 02.0?	Not applicable

2. **GWP_CH4 / GWP_{CH4}: GWP for CH4.**	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	This parameter refers to the Global warming potential of Methane. From 01/01/2013 (2nd commitment period) the value to be applied is 25 tCO_2e/tCH_4.
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes
Monitoring equipment	Not applied

Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Not applied
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Not applied
Calibration frequency / interval	Not applied
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Not applied
Is the calibration of measuring equipment carried out by an accredited person or institution?	Not applied
Is(are) the calibration(s) valid for the entire reporting period?	Not applied
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Not applied
How were the values in the monitoring report verified?	Values applied for 2nd commitment period.
If applicable, has the reported data been crosschecked with other available data?	Values published for 2nd commitment period
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Correct data has been transferred and applied in the ER calculations
In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by paragraph 231 b) the CDM Project Standard for PA– version 02.0?	Not applicable

3. **$Q_{,y}$ – Amount of organic waste type j prevented form disposal in the SWDS in the year x (EFB)**	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	The parameter refers to the amount of organic waste (only EFB) prevented from disposal in the SWDS. It was measured

		by weighting each load in the vehicle scale. All information was presented in the Bufalo System.
	Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Every load was measured by net weight of transport vehicles. The weighting is in accordance with MP.
	Monitoring equipment	The parameter is measured by a vehicle scale. However detailed information was not provided. Thus a CL has been raised. Refer to CL 01 After findings resolution, it has been observed that the monitoring equipment is in accordance with the one required by the Monitoring plan. The following equipment were installed during this monitoring period: - 80 ton weight scale – in operation between 2012 and present (SNs: 88917040, 270515/1842 and 2504182955) - 50 ton weight scale – in operation between 2012 and 2017 (SNs: 990920/894, 18140408 and 160514/1525)
	Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	The required accuracy of the equipment is duly described in the monitoring plan. However, as no information on the equipment was provided, a CL has been raised. After findings resolution, it has been observed that the accuracy is in accordance with the one required by the Monitoring plan. The accuracy of the equipment is: ±1% of full scale
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Refer to CL 01 After findings resolution it was observed that the accuracy is valid for the entire range of the equipment
	Calibration frequency / interval	The equipment calibration is to be conducted annually as per MP.
	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Refer to CL 01 After findings resolution it was observed that the calibration interval is in line with monitoring plan.

	Is the calibration of measuring equipment carried out by an accredited person or institution?	Refer to CL 01 After findings resolution it was observed that the calibration interval is in line with monitoring plan.
	Is(are) the calibration(s) valid for the entire reporting period?	Refer to CL 01 After findings resolution it was observed that there are gaps in the calibration interval. For further details refer to section E.7 below.
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Refer to CL 01 After findings resolution it was observed that the calibration interval is in line with monitoring plan.
	How were the values in the monitoring report verified?	The values in the ER calculations were checked in the internal integrated system. However, values were not reported in the MR. Thus a CL has been raised. Refer to CL 2 below After findings resolution it has been observed that the values were correctly reported in the MR.
	If applicable, has the reported data been crosschecked with other available data?	Parameter values were cross checked against value of FFB (fresh fruit bunches). As per PDD, the proportion EFB/FFB is approximately equal to 23%. However, cross-check has not being made. Thus CL 4 has been raised. After finding conclusion it was observed that the cross-check has been carried out and the values applied are reasonable. The results showed a proportion is between 11% and 15%. Thus the verification team considered reliable the amount of EFB reported. This result demonstrates that less waste (EFB) was generated and consequently the site remains able to accommodate the waste for the duration of crediting period, which is an applicability criteria of the AMS- III.F (point 8)
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Data was duly transferred to ER calculations and to MR. QA/QC process is in place.
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by paragraph 231 b) the CDM Project Standard for PA– version 02.0?	Not applicable

4. $Q_{,ww,y}$ – Volume of wastewater entering the co-composting facility in year y (POME)	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	The parameter refers to the amount of wastewater (only POME) that is displaced to the co-composting facility, being mixed with EFB.
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	The parameter value is measured by two flow meters, one from direct injection in the compost and other from contingency area, manually registered daily and transferred to a spreadsheet for aggregation. However only information until 25/08/2015 was provided to the verification team. Thus a CL has been raised. Refer to CL 04 After findings conclusion it has been observed that no information was available after 25/08/2015 and the PP requested a Temporary deviation to deal with this issue. Refer to PRC # 1 in the PRC validation report attached to this report.
Monitoring equipment	The parameter is measured by a flow meter with totalizer. However detailed information was not provided. Thus a CL has been raised. Refer to CL 01 After findings resolution, it has been observed that the monitoring equipment is in accordance with the one required by the Monitoring plan for the period which data is available (between 01/01/2013 and 25/08/2015).
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	The required accuracy of the equipment is duly described in the monitoring plan. However, as no information on the equipment was provided, a CL has been raised. After findings resolution, it has been observed that the accuracy is in accordance with the one required by the Monitoring plan
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Refer to CL 01 After findings resolution it was observed that the accuracy is valid for the entire range of the equipment
Calibration frequency / interval	The equipment calibration is to be conducted every three years as per MP.

	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Refer to CL 01 After findings resolution it was observed that the calibration interval is in line with monitoring plan.
	Is the calibration of measuring equipment carried out by an accredited person or institution?	Refer to CL 01 After findings resolution it was observed that the calibration interval is in line with monitoring plan.
	Is(are) the calibration(s) valid for the entire reporting period?	Refer to CL 01 After findings resolution, it has been observed that there are gaps in the calibration of the flow meter responsible for measuring this parameter. Refer to section E.7 for further details.
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Refer to CL 01 After findings resolution it was observed that the calibration interval is in line with monitoring plan.
	How were the values in the monitoring report verified?	The values in the ER calculations were checked in the internal integrated system. The values are in accordance with raw data presented to the verification team for the period which data was available.
	If applicable, has the reported data been crosschecked with other available data?	Parameter values were cross checked against value of FFB (fresh fruit bunches). As per PDD, the proportion EFB/FFB is approximately equal to 23%. However cross-check has not being made. Thus CL 4 has been raised. The results for the period are between 0.75 and 1.28 m^3 POME/ton of FFB, which is within the estimated in the PDD (0.8 m^3/ton). Only cross-check values for 2013 to 2015 were calculated due to lack of monitored data in other years. Thus the verification team considered reliable the amount of EFB reported.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Data was duly transferred to ER calculations and to MR. QA/QC process is in place.
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by paragraph 231 b) the CDM Project Standard for PA–version 02.0?	No information was available after 25/08/2015 and the PP requested a Temporary deviation to deal with this issue. Refer to PRC # 1 in the PRC validation report attached to this report. Approval of the measure is being requested on issuance track as allowed by CDM Project Standard for PA–

	version 02.0 Appendix, para 1.a) and PCP for PA, version 02.0 para 130.

5. **$BOD_{inflow,y}$: Biological oxygen demand of the wastewater entering the co-composting facility in the year y**	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	The parameter refers to the BOD values of the wastewater that enters the co-composting facility. The values are obtained by sampling the wastewater as per sampling plan defined in the PDD and analysed by external laboratory. As per monitoring plan there is a minimum of samples to be taken each year for the BOD. In case these amount is not achieved, a correction measure is to be carried out. Refer to section E.6.3 below. For this parameter, not all analysis evidences were provided, thus a CL has been raised. Refer to CL 4 After findings conclusion, it has been observed that data is only available for 2013, 2014 and 2015. Provisions described in section A4.3.C, Failure to achieve the target precision level, were carried out. As the minimum samples were not achieved a temporary deviation has been requested. Refer to PRC # 2 in the PRC validation report attached to this report. Moreover, as the parameter was not monitored from 01/01/2016 to 31/05/2019 another temporary deviation has been requested. Refer to PRC # 3 in the PRC validation report
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes
Monitoring equipment	The analysis was conducted by an accredited laboratory. Thus the equipment was not physically checked. The laboratory accreditation/17.2/ was checked and by that, the verification team concludes that the measurements were carried out as per recognized standards.
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	The analysis was conducted by an accredited laboratory. Thus the equipment was not physically checked. The laboratory accreditation/17.2/ was checked and by that, the verification team concludes that the measurements were carried out as per recognized standards.

Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	The verification team rely on the Lab accreditation for this matter.
Calibration frequency / interval	The verification team rely on the Lab accreditation for this matter.
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	yes
Is the calibration of measuring equipment carried out by an accredited person or institution?	The verification team rely on the Lab accreditation for this matter.
Is(are) the calibration(s) valid for the entire reporting period?	The verification team rely on the Lab accreditation for this matter.
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	The verification team rely on the Lab accreditation for this matter.
How were the values in the monitoring report verified?	The applied data (aggregated yearly) adjusted to the required precision (10%) and confidence level (90%)
If applicable, has the reported data been crosschecked with other available data?	Not applied.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	No. Refer to CL 4. After findings conclusion correct and conservative data has been transferred to the emission reduction calculations
In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by paragraph 231 b) the CDM Project Standard for PA– version 02.0?	1. Between 01/01/2013 and 31/12/2015 the PP did not manage to conduct the minimum samples the parameter as required by the MP. Refer to PRC # 2 in the PRC validation report attached to this report. Approval of the measure is being requested on issuance track as allowed by CDM Project Standard for PA– version 02.0 Appendix, para 1.a) and PCP for PA, version 02.0 para 130. 2. Between 01/01/2016 and 31/05/2019 the PP did not monitored the parameter. Refer to PRC # 3 in the PRC validation report attached to this report. The parameter has been estimated as stipulated by paragraph 231 b) the CDM Project Standard for PA– version 02.0

6. **EC_y: Electricity consumption from project activity equipment items in year y**

Criteria/Requirements	Assessment Observation
Measuring / Reading / Recording frequency	The parameter is measured by an electricity meter continuously read as required by the MR and is recorded in the integrated company's system.
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	yes
Monitoring equipment	The parameter is monitored by an power meter. However its information is not provided in the MR. Refer to CL 01 After findings resolution we observed that the equipment is duly detailed in the MR.
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Yes. Refer to the equipment description above
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	yes
Calibration frequency / interval	As per MP, the calibration is to be conducted every three years. Duly information is presented in the MR.
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Yes.
Is the calibration of measuring equipment carried out by an accredited person or institution?	No. No calibration was conducted during the monitoring period.
Is(are) the calibration(s) valid for the entire reporting period?	No. Calibration was only carried out after the end of monitoring period. Refer to section E.7
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	yes
How were the values in the monitoring report verified?	Data applied in the ER calculations was checked against data aggregated from company's integrated system. Not all data was available. Thus a CL has been raised.

	Refer to CL 04 After findings resolution it has been observed that all data has been provided and the parameter's value applied in the ER calculations are correct. Correction factors were applied for the period without calibration.
If applicable, has the reported data been crosschecked with other available data?	Not applied
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Correct and conservative data has been transfer to the emission reduction calculations. Correction factor was duly applied for the entire period.
In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by paragraph 231 b) the CDM Project Standard for PA– version 02.0?	Between 01/01/2016 and 29/02/2016 this parameter was not monitored. Refer to PRC # 4 in the PRC validation report attached to this report. The parameter has been estimated as stipulated by paragraph 231 b) the CDM Project Standard for PA– version 02.0

7. **TDL**: **Average technical transmission and distribution losses for the power grid**	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	This value is directly given by the applied "Tool to calculate baseline, project and/or leakage from electricity consumption, version 01" and described in the registered PDD. In case of application of default value, as per PDD, the value shall be revised as per latest version of the tool. According to TOOL 05 - *Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation version 03.0* – for project and leakage calculation, the value of 20% remains as default. Thus, the applied value is in accordance with latest version of the tool.
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	N/A
Monitoring equipment	N/A
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	N/A

Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	N/A
Calibration frequency / interval	N/A
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	N/A
Is the calibration of measuring equipment carried out by an accredited person or institution?	N/A
Is(are) the calibration(s) valid for the entire reporting period?	N/A
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	N/A
How were the values in the monitoring report verified?	N/A
If applicable, has the reported data been crosschecked with other available data?	Value was compared to values from more recent versions of the tool "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation" version 03, as required by PDD.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes. No QA/QC processes are in place for this parameter.
In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by paragraph 231 b) the CDM Project Standard for PA– version 02.0?	N/A

8. **$FC_{Diesel,y}$: Consumption of diesel fuel from project equipment in year y**	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	This parameter is measured by a fuel pump and correspond to the amount of diesel consumed in the windrow turner, the retroscavator and energy generator (not transportation of residues)
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	The parameter is measured by a fuel pump every fuelling event and it is registered in the company's system.

	Monitoring equipment	The parameter is monitored by a fuel pump. The company responsible for maintaining the equipment is TERPEL (fuel provider - third party). Thus this equipment is not within PP's control. After findings resolution we observed that the equipment is duly detailed in the MR. A fuel pump (S/N 0061-17) is the equipment responsible for measuring the fuel quantity.
	Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	The company responsible for maintaining the equipment is TERPEL (fuel provider - third party). Thus this equipment is not within PP's control.
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	The company responsible for maintaining the equipment is TERPEL (fuel provider - third party). Thus this equipment is not within PP's control.
	Calibration frequency / interval	The fuel provider carries out frequent calibration and maintenance of equipment. Even though this information is not provided to the PP, the verification team considers that as this pump is used for commercial purposes, the equipment maintenance is carried out accordingly. The equipment is not within PP's control.
	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Yes.
	Is the calibration of measuring equipment carried out by an accredited person or institution?	Yes
	Is(are) the calibration(s) valid for the entire reporting period?	Yes
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Yes
	How were the values in the monitoring report verified?	Fossil fuel consumed in the project activity was checked in the company's integrated system.
	If applicable, has the reported data been crosschecked with other available data?	Data was cross-checked with accounting records. The bigger values were applied in the ER calculations as a conservative measure.

Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes. Correct and conservative data has been transferred to MR. All QA/QC procedures are in place.
In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by paragraph 231 b) the CDM Project Standard for PA– version 02.0?	N/A

9. ***NCV_{Diesel}: Net calorific value of diesel fuel in volumetric units***	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	This parameter corresponds to the NCV of the diesel consumed in the PA. As no information from fuel supplier was provided, IPCC default value at the upper limit of the uncertainty at a 95% confidence was used for determining this parameter. Then it is converted to volumetric units.
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes
Monitoring equipment	N/A
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	N/A
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	N/A
Calibration frequency / interval	N/A
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	N/A
Is the calibration of measuring equipment carried out by an accredited person or institution?	N/A
Is(are) the calibration(s) valid for the entire reporting period?	N/A

Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	N/A
How were the values in the monitoring report verified?	Values were compared to the IPCC data.
If applicable, has the reported data been crosschecked with other available data?	Not applied as default values were used in the calculation.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes
In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by paragraph 231 b) the CDM Project Standard for PA–version 02.0?	N/A

10. $EF_{CO2,Diesel}$: ***Emission factor for diesel fuel***	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	This parameter corresponds to the CO2 emission factor of the diesel consumed in the PA. As no information from fuel supplier was provided, IPCC default value at the upper limit of the uncertainty at a 95% confidence was used for determining this parameter.
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes
Monitoring equipment	N/A
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	N/A
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	N/A
Calibration frequency / interval	N/A
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the	N/A

local/national standards, or as per the manufacturer's specifications?	
Is the calibration of measuring equipment carried out by an accredited person or institution?	N/A
Is(are) the calibration(s) valid for the entire reporting period?	N/A
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	N/A
How were the values in the monitoring report verified?	Values were compared to the IPCC data.
If applicable, has the reported data been crosschecked with other available data?	Not applied as default values were used in the calculation.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes
In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by paragraph 231 b) the CDM Project Standard for PA– version 02.0?	N/A

11. $Q_{y,portion}$: ***Portion of waste material that is composted in the presence of less than 8% oxygen***	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	This parameter corresponds to the proportion of all waste material (as defined in the parameter Qy – EFB) which is decomposed with presence of less than 8% Oxygen. The verification of the oxygen content is made by spot sampling of oxygen content in compost piles as per sampling procedure to parameter Qy defined in the PDD Annex 4, section A4.2 with minimum 271 samples per year. For sampling details, refer to section E.6.3 below.
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	The applied frequency is in accordance with registered monitoring plan for years 2013 to 2016. For further years, no information has been provided. Refer to CL 4 below After findings conclusion it has been observed that a temporary deviation has been requested applying conservative assumptions to the parameter Qy portion taking into account that the samples were not conducted between 2017 and 2019. Refer to PRC # 5 described in the

		Validation report attached to this report for full assessment.
	Monitoring equipment	The equipment applied is an oxygen meter with a 1 m lance. However, details on the equipment were not provided. Refer to CL 01 After findings resolution information on the equipment has been included in the MR. The equipment applied for the measurements is a portable oxygen meter with a 1m lance (S/N 802779)
	Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	yes
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	yes
	Calibration frequency / interval	The MP states that the equipment has to be self-calibrating oxygen probe. However, details on the equipment were not provided. Refer to CL 02 After findings resolution information on the equipment has been included in the MR.
	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	yes
	Is the calibration of measuring equipment carried out by an accredited person or institution?	Not applied. The equipment is self-calibrated with ambient air which is carried out before every measurement. Registers were provided/19/
	Is(are) the calibration(s) valid for the entire reporting period?	Yes
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Yes
	How were the values in the monitoring report verified?	Values were verified by checking the Oxygen analysis results and compare to the parameter value.
	If applicable, has the reported data been crosschecked with other available data?	Not applied

Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes.
In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by paragraph 231 b) the CDM Project Standard for PA– version 02.0?	Between 01/01/2017 and 31/05/2019 no Oxygen analysis were conducted in the residues piles, thus, this parameter could not be monitored. A temporary deviation has been requested. Refer to PRC # 5 in the PRC validation report attached to this report. Approval of the measure is being requested on issuance track as allowed by CDM Project Standard for PA– version 02.0 Appendix, para 1.a) and PCP for PA, version 02.0 para 130.

12. $Q_{,ww,runoff}$: ***Volume of runoff water in year y***	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	The parameter refers to the amount of runoff water (POME) that leaves the co-composting plant.
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	The parameter value is measured by flow meter continually monitored and monthly aggregated by company's integrated system. However only information until 2015 was provided to the verification team. Thus a CL has been raised. Refer to CL 04 After findings conclusion it has been observed that no information was available after 25/08/2015 and the PP requested a Temporary deviation to deal with this issue. Refer to PRC # 6 in the PRC validation report attached to this report.
Monitoring equipment	The parameter is measured by a flow meter with totalizer. However detailed information was not provided. Thus a CL has been raised. Refer to CL 01 After findings resolution, it has been observed that the monitoring equipment is in accordance with the one required by the Monitoring plan
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with	The required accuracy of the equipment is duly described in the monitoring plan. However, as no information on the equipment was provided, a CL has been raised. Refer to CL 01

	local/national standards, or as per the manufacturer's specification?	After findings resolution, it has been observed that the accuracy is in accordance with the one required by the Monitoring plan
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Refer to CL 01 After findings resolution it was observed that the accuracy is valid for the entire range of the equipment
	Calibration frequency / interval	The equipment calibration is to be conducted every three years as per MP.
	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Refer to CL 01 After findings resolution it was observed that no calibration has been conducted to the meter and maximum value has been applied for the monitored value. Refer to section E.7 below..
	Is the calibration of measuring equipment carried out by an accredited person or institution?	Refer to CL 01 After findings resolution it was observed that no calibration has been conducted to the meter and maximum value has been applied. Refer to section E.7 below.
	Is(are) the calibration(s) valid for the entire reporting period?	Refer to CL 01 After findings resolution it was observed that no calibration has been conducted during the monitoring period. Thus, the maximum permissible error of the equipment between 01/01/2013 and 24/08/2015. After this date, from 25/08/2015 onwards no measurements occurred. Thus, a PRC is being requested during this period to account for project emissions..
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Refer to CL 01 After findings resolution it was observed that no calibration has been conducted for this meter. Maximum permissible error has been applied. Refer to section E.7 below.
	How were the values in the monitoring report verified?	The values in the ER calculations were checked in the internal integrated system. The values are in accordance with raw data presented to the verification team.
	If applicable, has the reported data been crosschecked with other available data?	Not applied
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Data was duly transferred to ER calculations and to MR.

In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by paragraph 231 b) the CDM Project Standard for PA– version 02.0?	No information was available after 25/08/2015 and the PP requested a Temporary deviation to deal with this issue. Refer to PRC # 2 in the PRC validation report attached to this report. The parameter has been estimated as stipulated by paragraph 231 b) the CDM Project Standard for PA– version 02.0

13. **$COD_{y,ww,runoff}$: Chemical oxygen demand of the runoff water leaving the composting facility in the year y**	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	The parameter refers to the COD values of the wastewater that leaves the co-composting facility - lixiviate. The values are obtained by sampling the wastewater as per sampling plan defined in the PDD and analysed by external laboratory. As per monitoring plan there is a minimum of samples to be taken each year for the BOD. In case these amount is not achieved, a correction measure is to be carried out. Refer to section E.6.3 below. For this parameter, not all analysis evidences were provided, thus a CL has been raised. Refer to CL 4 After findings conclusion, it has been observed that data is only available for 2013, 2014 and 2015. Provisions described in section A4.3.C, Failure to achieve the target precision level, were carried out. As the minimum samples were not achieved a temporary deviation has been requested. Refer to PRC # 2 in the PRC validation report attached to this report. Moreover, as the parameter was not monitored from 01/01/2016 to 31/05/2019 another temporary deviation has been requested. Refer to PRC # 3 in the PRC validation report
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes
Monitoring equipment	The analysis was conducted by an accredited laboratory. Thus the equipment was not physically checked. The laboratory accreditation/17.2/ was checked and by that, the verification team concludes that the measurements were carried out as per recognized standards.
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does	The analysis was conducted by an accredited laboratory. Thus the equipment was not physically checked. The laboratory accreditation/17.2/ was checked and by that, the verification

	the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	team concludes that the measurements were carried out as per recognized standards.
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	The verification team rely on the Lab accreditation for this matter.
	Calibration frequency / interval	The verification team rely on the Lab accreditation for this matter.
	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	yes
	Is the calibration of measuring equipment carried out by an accredited person or institution?	The verification team rely on the Lab accreditation for this matter.
	Is(are) the calibration(s) valid for the entire reporting period?	The verification team rely on the Lab accreditation for this matter.
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	The verification team rely on the Lab accreditation for this matter.
	How were the values in the monitoring report verified?	The applied data (aggregated yearly) adjusted to the required precision (10%) and confidence level (90%)
	If applicable, has the reported data been crosschecked with other available data?	Not applied.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	No. Refer to CL 4. After findings conclusion correct and conservative data has been transferred to the emission reduction calculations
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by paragraph 231 b) the CDM Project Standard for PA– version 02.0?	1. Between 01/01/2013 and 31/12/2015 the PP did not manage to conduct the minimum samples the parameter as required by the MP. Refer to PRC # 2 in the PRC validation report attached to this report. Approval of the measure is being requested on issuance track as allowed by CDM Project Standard for PA– version 02.0 Appendix, para 1.a) and PCP for PA, version 02.0 para 130. 2. Between 01/01/2016 and 31/05/2019 the PP did not monitored the parameter. Refer to PRC # 3 in the PRC validation report attached to this report. The parameter has been estimated as stipulated by paragraph 231 b) the CDM Project Standard for PA– version 02.0

14. **Compost Quality Control Program**	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	This parameter refers to the procedures adopted by the PP to operate the co-composting system and which ensures aerobic conditions to waste during composting process. It is included in the quality control program of the company.
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	yes
Monitoring equipment	N/A
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	N/A
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	N/A
Calibration frequency / interval	N/A
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	N/A
Is the calibration of measuring equipment carried out by an accredited person or institution?	N/A
Is(are) the calibration(s) valid for the entire reporting period?	N/A
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	N/A
How were the values in the monitoring report verified?	N/A
If applicable, has the reported data been crosschecked with other available data?	N/A
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	N/A
In case project participants have temporarily not monitored the	N/A

parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by paragraph 231 b) the CDM Project Standard for PA– version 02.0?	

15. **Adequate soil application of compost**	
Criteria/Requirements	**Assessment Observation**
Measuring / Reading / Recording frequency	This parameter refers to the control of compost application in the soil. This application is to ensure the correct aerobic decomposition of the compost. The control is made annually through photographic evidence of compost application/24/. Furthermore, during the site visit, this practice was observed and pictures were taken as evidence/24/.
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	yes
Monitoring equipment	N/A
Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	N/A
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	N/A
Calibration frequency / interval	N/A
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	N/A
Is the calibration of measuring equipment carried out by an accredited person or institution?	N/A
Is(are) the calibration(s) valid for the entire reporting period?	N/A
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	N/A
How were the values in the monitoring report verified?	The practice is verified on site and through photographic evidences.

	If applicable, has the reported data been crosschecked with other available data?	The cross-check is made by comparing the compost yields as a percentage of EFB.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	N/A
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by paragraph 231 b) the CDM Project Standard for PA–version 02.0?	N/A
Findings	*CL 01* *MR section D.2:* *The measuring equipment and its calibration details are not described for the following parameters: Qy, Qww,y ECy, FCy, Qy,portion, Q,ww,runoff* *CL 02* *MR section D.2 parameter Qy: values monitored were not reported in the MR.* *CL 03* *MR section D.2:* *The cross-check measures detailed in the PDD are not being demonstrated for the following parameters: Qy, Qww,y, $FC_{diesel,y}$.* *CL 04* *No evidence has been provided for the following parameters:* - *Qww,y – values from 2018 to 2019 were not provided.* - *Not all evidences of BOD and COD analysis results applied in the ER calculations between 2013 and 2015 were presented to the verification team and no evidences from 2016 to 2019 were provided at all* - *ECy between January and February 2016 is missing* - *O2 measurements (for determining parameter Qy,portion) between 01/01/2017 and 31/05/2019* - *Qww,runoff – values from 2016 to 2019 were not provided.*	
Conclusion	After the findings resolutions all parameters were determined in a conservative manner and in accordance with requirements of applied tools, methodology and monitoring plan. Temporary deviation was requested to deal with parameters that were not monitored as per MP during the monitoring period. Conservative assumptions were taken. Refer to PRC validation report attached to this report for further details. All parameters were duly included in the MR section D.2 as per PDD.	

E.6.3. Implementation of sampling plan

Means of verification	The project participants have applied sampling plan for determining the following parameters: **$Q_{y,portion}$:** in order to determine the portion of waste material that is composted in the presence of less than 8% oxygen, a sampling is conducted to analyse oxygen in the compost. The sampling procedure is described in the PDD and it aims to have 90% confidence and 10% precision. A simple random sampling was applied and the proportion of 50% was estimated to be below 8%. Thus, the sampling

	procedure results in n ≥ 271 samples per year. However, not all years this samples amount was registered. Refer to CAR 01 **$BOD_{inflow,}$, $COD_{y,ww,runoff}$:** in order to determine the biological oxygen demand of the wastewater entering the co-composting facility and the chemical oxygen demand of the runoff water leaving the composting facility with 90% confidence and 10% precision, a sampling procedure was described in the PDD where a minimum of 30 samples per year is to be obtained. In case the precision level is not achieved, procedure detailed in the PDD section A4.3.C "Failure to achieve the target precision level" is to be carried out. However considering that the minimum amount of samples was not achieved for the whole MP, it was observed that this procedure was not followed. Refer to CAR 01 below.
Findings	CAR 01 - *Considering that the minimum samples were not reached for all years for parameters BOD and COD, the sampling procedure has not being followed as per PDD section A.4.3 – "Failure to achieve the target precision level".* - *Moreover, no information has been detailed regarding the sampling results for parameters BOD, COD and Qy,portion in section D.3 of the MR as required by the information for completing the MR.*
Conclusion	Regarding BOD and COD, it was observed that the minimum samples were not achieved during the MP. Therefore, a temporary deviation was requested to be approved by the EB. Refer to PRC # 2. Moreover, no samples of these parameters were taken from 2016 onwards. Therefore, another temporary deviation has been requested (PRC #3). Regarding the parameter Qy,portion, no O_2 samples were conducted from 2017 onwards. Thus another temporary deviation (PRC #4) has been requested. For all temporary deviations, refer to PRC validation report attached to this report

E.7. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	Manuals of equipment, national regulations registered monitoring plan and calibration certificates were checked in order to verify the compliance and frequency of the calibrations/inspections requirements of measuring equipment. However, some inconsistencies were found in the Calibration procedures. Thus, a CL has been raised.
Findings	Refer to CL 01 above.
Conclusion	All available calibration certificates were provided to the verification team. As a result, the following has been concluded.

Parameter	Equipment – S/N	Calibration dates	delays
Qy Operation: 2012 to current Operation: 2012 to 2017	Truck scales 80 Ton S/N: 270515/1842 S/N: 2504182955 50 ton S/N: 990920/894 S/N: 18140408 S/N: 160514/1525	Yearly calibration 13/03/2016 and 13/04/2017 30/09/2018 17/10/2012 08/09/2013 13/03/2016 and 13/042017	13/04/2018 to 29/09/2018[3] 08/09/2014 to 12/03/2016 13/03/2017 to 12/04/2017
Qww,y[4]	Flow meter	3-year calibration	

[3] This parameter is used in the PE calculation only when Oxygen concentration is below 8% (applied as $Q_{y,portion}$). As between 2013 and 2016 the oxygen measured was above this limit, the delays in this equipment during this period (2013-2016) were not accounted as they did not affect the ER calculations.

[4] Even thought the flow meter has its calibration delayed between 12/09/2013 and 31/05/2019, the correction factor was applied along all monitoring period conservatively.

	Exchange of both meters occurred on 12/09/2013	Contingency S/N: 06110635 S/N: 11122019 Irrigation S/N: 05118633 S/N: 042017002386	09/06/2011 11/09/2019 21/05/2011 11/09/2019	12/09/2013 – 31/05/2019 12/09/2013 – 31/05/2019
	ECy	Power meter Main S/N: 17014280 Backup S/N: 15220400	3-year calibration 16/09/2019 16/09/2019	 01/01/2013 to 31/05/2019
	$Q_{,ww,runoff}$	Flow meter S/N:11122013	No calibration certificate is available for the installed meter and the meter installed during the monitoring period is no longer available as well.[5]	01/01/2013 to 31/05/2019
	Qy,portion	Oxygen Probe S/N: 802779	Calibrated with ambient air every measurement as per equipment procedure/18/	No delays
	To the delayed period, correction factors have been applied using the maximum value between the calibration result and the maximum permissible error of the equipment in accordance to VVS version 02.0 paragraph 366. All correction factors were applied conservatively and are traceable in the ER calculations spreadsheet during the period not covered by the calibrations. The measure is considered conservative by the verification team.			

E.8. Assessment of data and calculation of emission reductions or net removals

E.8.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

Means of verification	Baseline emission was calculated using the equation #1 from applied methodology AMS-III.F ver 10; as only baseline emissions from wastewater co-composted apply, the formula is equal to the following: $$BEy = BE_{ww,treatment}$$ Where: BEy = Baseline emissions in year y $BE_{ww,treatment,y}$ = Baseline emissions from wastewater co-composted in year y As per methodology AMS-III.H ver 16, the above baseline emissions are calculated as follows $$BEww,treatment = Q_{ww,i,y}.BOD_{inflow,y}\ .\ \eta_{BOD,y}\ .MCF_{ww,treatment,y}\ .B_{o,ww}\ .UF_{BL}\ .GWP_{CH4}$$ Where $Q_{ww,i,y}$ = volume of wastewater entering the co-composting facility in year y (m^3) $BOD_{inflow,y}$ = Biological oxygen demand of the wastewater entering the co-composting facility in year y (tonnes/m^3) $\Pi_{BOD,y}$ = BOD removal efficiency of the baseline WWTS $MCF_{ww,treatment}$ = Methane correction factor for the wastewater treatment system in the baseline scenario $B_{o,ww}$ = methane producing capacity for the wastewater (kg CH_4/ kg BOD) UF_{BL} = model correction factor to account for model uncertainties for wastewater.

[5] The correction factor applied in this parameter is the maximum permissible (4%) for the whole period as a conservative measure. The meter is not available so it is not possible to conduct its calibration.

Findings	Refer to findings above in section E.6.2
Conclusion	The verification team confirms that: a. the monitored data was available in accordance with the registered monitoring plan for the operational period of the plant. For the cases they are not available, temporary deviations were requested. Refer to PRC Validation report; b. the reported data were crosschecked, as prescribed in the revised approved PDD, with the relevant supporting and were found consistent; c. appropriate methods and formulae for calculating baseline GHG emissions have been followed; d. the assumptions, emission factors and default values that were applied in the calculations are correct and evidenced; e. the calculations are transparent, consistent, correct and complete. The value of BE is equal to

Year	Value (tCO_2e)
2013	59,148
2014	43,940
2015	24,915
2016	0
2017	0
2018	0
2019	0
TOTAL for MP	**128,004**

E.8.2. Calculation of project GHG emissions or actual net anthropogenic GHG removals by sinks

Means of verification	According to the applied methodology AMS-III.F ver 10 equation #3, project emissions were calculated as follows (only applicable terms were included): $$PEy = PE_{y,Power} + PE_{y,comp} + PE_{y,runoff}$$ Where: PEy = Project emissions in year y $PE_{y,power}$= Project emissions from electricity or fossil fuel consumption in year y $PE_{y,comp}$= Methane emissions during composting process in year y $PE_{y,runoff}$= Methane emissions from runoff water in year y These Project emissions were calculated as per AMS-III.F version 10 and were duly described in the registered PDD under equations number 4, 5 and 6 respectively.
Findings	Refer to findings above in section E.6.2
Conclusion	The verification team confirms that: a. Project emission were calculated conservatively. Conservative emission factors were applied when the parameter was not monitored as per MP or when the equipment calibrations did not cover the whole MP.; b. the reported data were crosschecked, as prescribed in the revised approved PDD, with the relevant supporting and were found consistent; c. appropriate methods and formulae for calculating baseline GHG emissions have been followed; d. the assumptions, emission factors and default values that were applied in the calculations are correct and evidenced; e. the calculations are transparent, consistent, correct and complete. The value of PE is equal to

Year	Value (tCO_2e)
2013	4,703
2014	2,126

		2015	4,710	
		2016	11,412	
		2017	12,149	
		2018	11,886	
		2019	4,918	
		TOTAL for MP	**51,905**	

E.8.3. Calculation of leakage GHG emissions

Means of verification	As no equipment is transferred from another activity in this project activity, according to the applied methodology AMS-III.F, leakage is not to be considered.
Findings	N/A
Conclusion	No leakage is to be accounted for this project activity.

E.8.4. Summary calculation of GHG emission reductions or net anthropogenic GHG removals by sinks

Means of verification	The emission reductions from the project activity are based on baseline and project emissions. The calculations presented at the final MR and corresponding ER calculation spreadsheet were found to be appropriate. However as some findings were raised, No conclusion can be given at this point. The verification team confirms an audit trail that contains the evidences and records of validated figures. However not clear information was provided in the MR. Thus a CL has been raised.
Findings	CL 05 *Section E.1, E.2, sample calculation for all formulae applied in the BE and PE were not included as required by instructions for completing the MR.*
Conclusion	The verification team confirms that appropriate methods and formulae for calculating baseline GHG emissions reductions have been followed. The summary table has been correctly presented at the MR and the figures are correct and justified. $$ER_n = BE_y - PE_y$$ LE = 0 Thus,

Year	**Value (tCO_2e)**
2013	54,445
2014	41,814
2015	20,205
2016	-11,412
2017	-12,149
2018	-11,886
2019	-4,918
TOTAL for MP	**76,099**

E.8.5. Comparison of actual GHG emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Means of verification	The actual emission reductions were checked against the estimates of the registered PDD and the values were reported in the MR. However the presented values are not traceable, thus a CL has been raised.
Findings	CL 06 *The estimated ERs presented in the MR front page and section E.5 is not in accordance with the ones obtained in the registered PDD.*
Conclusion	The comparison of actual values of the monitoring period with the estimates in the registered PDD is properly presented at the MR. The actual emission reductions are lower than the estimated values.

E.8.6. Remarks on difference from estimated value in registered PDD

Means of verification	The verification team has compared the actual ER calculated and the estimated ERs reported in the PDD for the same period.

Findings	N/A
Conclusion	The actual ERs are lower than the estimated emission reductions reported in the revised PDD, thus, no justification is needed

E.8.7. Actual GHG emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

Means of verification	Earthood Services Private Limited is able to certify that the emission reductions from the CDM project activity "Punta Pereira biomass power plant" – Ref. 7789 for the monitoring period from 01/01/2017 to 31/12/2018 (including both days) is as follows: Verified and certified emission reductions as per commitment period: Commitment period: Amount Up to 31/12/2012 (1st commitment period): 0 tCO_2e From 01/01/2013: 76,099 tCO_2
Findings	-
Conclusion	The GHG emissions reductions have been totally generated from 01/01/2013.

E.9. Assessment of reported sustainable development co-benefits

Means of verification	Not applicable
Findings	-
Conclusion	The PPs have not requested the DOE to verify the sustainable development co-benefits for this project activity

E.10. Global stakeholder consultation

Means of verification	As per PCP paragraph 186, "The DOE shall make the monitoring report publicly available through a dedicated interface on the UNFCCC CDM website, at the latest 21 days prior to undertaking the on-site inspection for the verification, if to be conducted." The MR was made publicly available on 21/06/2019 whereas the site visit was conducted from 16/07/2019, thus fulfilling the above requirement. According to the Project Cycle Procedure for project activities, version 02.0, paragraph 187, "For the monitoring report for the first monitoring period, stakeholders may submit comments, in English, within 14 days of publication of the monitoring report, to the DOE through a dedicated interface on the UNFCCC CDM website". The verification team checked the UNFCCC CDM website and observed that no comments have been made public during the comments period.
Findings	-
Conclusion	The assessment was made in accordance with VVS para. 391 and PCP paras 186 and 187. No comments were received.

SECTION F. Internal quality control

The draft verification report that is prepared by verification team is reviewed by an independent technical review team (one or more members) to confirm if the internal procedures established and implemented by ESPL were duly complied with and such opinion/conclusion is reached in an objective manner that complies with the applicable CDM rules/requirements.

The technical review team is collectively required to possess the technical expertise of all the technical area/sectoral scope to which the project activity is related. All members of technical review team are independent of the verification team.

During the technical review process, additional findings may be identified or the closed out findings may be opened, which needs to be satisfactorily resolved before the request for issuance is submitted to UNFCCC. The independent technical reviewer may either approve the report as such or reject/return the same in such case providing the comments/findings/issues that needs to be

resolved by the verification team. The decision taken by the technical reviewer is final and is authorized on behalf of ESPL

SECTION G. Verification opinion

Earthood Services Private Limited, contracted by Palmeras de la Costa S.A, has performed the independent verification of the emission reductions for the CDM project activity "Palmeras POME Co-composting Project" – Ref.: 8918 – in Colombia, for the monitoring period from 01/01/2013 to 31/05/2019 (including both days) as reported in the Monitoring Report (public) – version 1. South Pole Carbon Asset Management S.A.S is responsible for the compilation of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project activity.

ESPL commenced the verification based on the baseline and monitoring methodology AMS-III.F ver. 10.0, the monitoring plan contained in the registered PDD /5/, Monitoring Report (public) /7/.

ESPL's verification approach is based on the understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. ESPL planned and performed the verification by obtaining evidence and other information and explanations that ESPL considered necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

The verification team confirms that:

- the project activity was found completely implemented as per the description given in the registered PDD for the operational period of the PA; and
- the actual operation conforms to the description in the registered PDD.

SECTION H. Certification statement

Earthood Services Private Limited, contracted by Palmeras de la Costa S.A, has performed the independent verification of the emission reductions for the CDM project activity "Palmeras POME Co-composting Project" – Ref.: 8918 in Colombia, for the monitoring period from 01/01/2013 to 31/05/2019 (including both days) as reported in the Monitoring Report (public) – version 1. South Pole Carbon Asset Management S.A.S is responsible for the compilation of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project activity.

ESPL commenced the verification based on the baseline and monitoring methodology AMS-III.F ver. 10.0, the monitoring plan contained in the registered PDD /5/, Monitoring Report (public) /7/.

ESPL's verification approach is based on the understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. ESPL planned and performed the verification by obtaining evidence and other information and explanations that ESPL considered necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

In our opinion the GHG emissions reductions reported for the project activity for the period from 01/01/2013 to 31/05/2019 (including both days) are fairly stated in the Monitoring Report (final)/8/. The GHG emission reductions were calculated correctly based on the baseline and monitoring methodology AMS-III.F ver. 10.0 and the monitoring plan contained in the registered PDD.

Earthood Services Private Limited is able to certify that the emission reductions from the CDM project activity "Palmeras POME Co-composting Project", in Colombia, for the period from 01/01/2013 to 31/05/2019 (including both days) is equal to 76,099 tCO2e.

Verified and certified emission reductions as per commitment period:

Commitment period	Amount
Up to 31/12/2012 (1st commitment period)	0 tCO_2e
From 01/01/2013 onwards	76,099 tCO_2e

Appendix 1. Abbreviations

Abbreviations	Full texts
ADME	Electric Market Administration (Administración del Mercado Electrico)
BE	Baseline Emission
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CL	Clarification Request
CM	Combined Margin
CME	Coordinating/Managing Entity
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
CP	Crediting Period
DOE	Designated Operational Entity
EB	Executive Board
EIA	Environmental Impact Assessment
ESPL	Earthood Services Private Limited
FAR	Forward Action Request
GHG	Green House Gas
GSC/GSP	Global Stakeholder Consultation Process
GW	Giga Watt
GWh	Giga Watt hour
IPCC	Intergovernmental Panel on Climate Change
KP	Kyoto Protocol
kW	kilo Watt
kWh	kilo Watt hour
LoA	Letter of Approval/Authorization
MDP	Montes del Plata
MME	Ministry of Mines and Energy from Colombia
MoC	Modalities of Communication
MoV	Means of Validation
MP	Monitoring Plan
MW	Mega Watt
MWh	Mega Watt hour
OM	Operating Margin
PA	Project Activity
PCP	Project Cycle Procedure
PDD	Project Design Document
PE	Project Emission
PP	Project Participant
PS	Project Standard
tCO_2e	Tonnes of Carbon di oxide equivalent
UNFCCC	United Nations Framework Convention on Climate Change
VT	Verification Team
VVS	Validation and Verification Standard

Appendix 2. Competence of team members and technical reviewers

Competence Statement			
Name	Marcelo Sebben		
Country	Brazil		
Education	M.Sc. (Sustainable Energy System) B. Eng. (Chemical Engineering)		
Experience	12.5 Years		
Field	Chemical process industry, CDM, Energy, Climate Change		
Approved Roles			
Team Leader	Yes		
Validator	Yes		
Verifier	Yes		
Methodology Expert	Yes (ACM0001, ACM0002, ACM0006, AM0065, AMS ID, AMS-I.E, AMS-I.C, AM0026, AMS-I.A, AMS-I.F, GS: Ecologically Sound Fuel Switch to Biomass with Reduced Energy Requirement, GS: Technologies and Practices to Displace Decentralized Thermal Energy Consumption)		
Local expert	Brazil, Chile, Honduras, Colombia		
Financial Expert	Yes		
Technical Reviewer	No		
TA Expert	Yes (TA 1.1, 1.2, 4.1, 5.1, 9.1, 13.1)		
Reviewed by	Shreya Garg	**Date**	02/09/2019
Approved by	Anshika Gupta	**Date**	02/09/2019

Competence Statement			
Name	Ricardo Lopes		
Country	Brazil		
Education	Technical Diploma in Data Processing		
Experience	12 years		
Field	CDM, Energy, Environment		
Approved Roles			
Team Leader	Yes		
Validator	Yes		
Verifier	Yes		
Methodology Expert	Yes (ACM0001, ACM0002, AM0026, AMS ID, AMS IIIH)		
Local expert	Brazil, Argentina, Chile, Colombia, Costa Rica, Dominican Republic, Equador, Honduras, Mexico, Nicaragua, Uruguay		
Financial Expert	Yes		
Technical Reviewer	No		
TA Expert	Yes (1.2, 13.1)		
Reviewed by	Shreya Garg	**Date**	04/06/2019
Approved by	Anshika Gupta	**Date**	04/06/2019

Competence Statement	
Name	Ashok Gautam

Country	India		
Education	M. Sc. (Environmental Sciences) M. Tech. (Energy & Environmental Management)		
Experience	16 Years +		
Field	Energy, Climate Change & Environment		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS-I.D., AMS-I.A., AMS-I.C., AMS-I.E, AMS-II.D., AMS-II.G., AMS-III.E., AMS-III.H., AMS-III.Q, AMS-III.Z., AMS-III.AV., AM0029, AM0025, AM0056, ACM0001, ACM0002, ACM0004, ACM0012, ACM0006, AM0018, ACM0009, AM0034, AMS.I.B		
Local expert	YES (India)		
Financial Expert	YES		
Technical Reviewer	YES		
TA Expert	YES (TA 1.1, TA 1.2, TA 3.1, TA 13.1)		
Reviewed by	Shreya Garg	**Date**	25/01/2019
Approved by	Anshika Gupta	**Date**	25/01/2019

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1.	UNFCCC	Standard: CDM PS for PA	version 02.0	Others
2.	UNFCCC	Standard: CDM PCP for PA	version 02.0	Others
3.	UNFCCC	Standard: CDM VVS for PA	version 02.0	Others
4.	UNFCCC	Form: CDM-MR-FORM	version 7.0	Others
5.	PP	Registered PDD	version 05 – 24/09/2012	Others
6.	UNFCCC	Applied methodologies AMS-III.F "Avoidance of methane emissions through composting" (version 10.0) For baseline calculations due to wastewater co-composted the following methodology is applicable AMS-III.H "Methane recovery in wastewater treatment"	ver. 10.0 ver 16.0	Others
7.	PP	Monitoring Report (draft)	version 1 – 19/06/2019	PP
8.	PP	Monitoring Report (revised/final)	Version 02 10/09/2019 Version 3.0 12/11/2019	PP
9.	PP	ER Spreadsheet (draft)	19/06/2019	PP
10.	PP	ER Spreadsheet (revised/final)	Version 02 10/09/2019 Version 03 21/10/2019	PP
11.	PP BUFALO	Data for parameter Qy (amount of waste prevented form disposal in SWDS 1. Aggregated data obtained directly from truck scale system - Bufalo		
12.	PP	Data for parameter Qww,y (amount of wastewater entering the co-composting facility 1. Data read directly in the accumulation flowmeter - data included manually in the spreadsheet "Control y Registro Compost YYYY" – flows considered for this parameter are *Riego* and *Contingencia*		
13.	PP	Data for parameter Qy,ww,runoff (amount of runoff water - lixiviate		

		1. Data read directly in the accumulation flowmeter - data included manually in the spreadsheet "Control y Registro Compost YYYY" – flow considered for this parameter is *Lixiviado*		
14.	PP	<u>Parameter ECy – Electricity consumed by PA</u> 1. Data extracted directly from the company's system – compost area is one specific cost centre and all electricity consumed by the PA is measured by one electricity meter.		
15.	PP	<u>FCy: Fossil Fuel Consumption Data – data from aerator, retroscavator and energy generator were considered for the FC consumption.</u> 1. Years 2013 and 2014 – values presented in the Company's system 2. Years 2015 and 2016 – Manuscripts have been verified (all data – approx. 120 data per year- all were checked) 3. 2017 from 2019 – data measured and accounted in the accountability were considered		
16.	PP	<u>Amount of O2 in the compost piles for determining the parameter Q,y,portion</u> 1. Data manually included in the spreadsheet "Medicion Oxygen" 2. Company's system which informs the amount of sampling and the amount resulting in O2 below 8%		
17.	Lab Nancy Flores Garcia	<u>Parameter BOD and COD</u> 1. Laboratory results for BOD5 and COD analysis for POME and Runoff water respectively 2. Laboratory Accreditation under IDEAM -	29/07/2014	

		RESOLUCION_1927_2014		
18.	Reotemp Instruments	Calibration procedures 1. Calibration procedure of Oxygen probe used to determine the parameter Qy,portion - oxyproinst.0909		
19.	PP	Screen shots from internal systems - EFB data - FFB data - Qy, - Q,ww,y - Q,ww,runoff - ECy - FCy		
20.	Lovato	Technical information 1. Flow meter (Lovato Electric_DMG800_Metering instruments)		
21.	Calidad Ambiental Ingenieria Ltda Labormar	Environmental Report sent to "Regional Autonomous Corporation" (regional environmental authority) of Cesar - INF 202-17-01 - this report demonstrates the appropriate reuse and application of POME to the composting piles by the company, indicating that the project activity was operational - Analysis report # 4335 issued by regarding regarding characterization of Residual Water	01/02/2018 May/June/2019	
22.	Corpocesar	Environmental Licence - Resolucion # 0658 issued by Corporacion Autonoma Regional del Cesar (CorpoCesar) informing the permission of operating the Project plant and of discarding the POME in the compost (project activity)	19/07/2016	
23.	TUV-Rheinland	Validation report “Palmeras POME Co-composting Project” in Colombia – version 7 - Validation report # 019979105060286 issued by TUV Rheinland scrape44	18/12/2012	
24.	Colombian Government	National legislation 1. Law 1934/2018 – Guidelines for Climate Change Management – issued by National Congress.	27/07/2018 01/06/2017	

		2. Decree 926 – National Rules for Taxes over Carbon Consumption issued by Ministry of Treasury and Public Credit of Colombia 3. Resolution 909 – Standard for allowed gas emissions to atmosphere from fixed sources, issued by Ministry of Environment, Housing and Territorial Development 4. Resolution 1207 of 2014 that establish the conditions of reuse and destination of industrial residual water and state the conditions of these discards.	05/06/2008 25/07/2014	
25.	ESPL PP	Parameter **Adequate soil application of compost** 1. Pictures from soil application taken during on-site visit 2. Photographic report carried out by company.		
26.	-	DNA of Colombia (Ministry of Environment and Sustainable Development)	http://www.minambiente.gov.co/	Other
27.	IPCC	IPCC publications	www.ipcc-nggip.iges.or.jp	Other
28.	UNFCCC	UNFCCC	http://cdm.unfccc.int	Other

Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1. Remaining FAR from validation and/or previous verifications

FAR ID	01	**Section no.**	Exx	**Date :** xxxx
Description of FAR				
Project participant response				**Date :** xxx
Documentation provided by project participant				
DOE assessment				**Date:** xxxx

Table 2. CL from this verification

CL ID	01	**Section no.**	E.6.2	**Date :** 18/07/2019
Description of CL				
MR section D.2: - *The measuring equipment and its calibration details are not described for the following parameters: Qy, Qww,y ECy, FCy, Qy,portion, Q,ww,runoff*				
Project participant response				**Date :** 05/09/2019
Calibration details were included in each parameter.				
Documentation provided by project participant				
190910_Monitoring report_Palmeras.docx				
DOE assessment				**Date:** 11/09/2019
The information regarding the following parameters was included 1. Qy, 2. FCy 3. Qy,portion However the information from the equipment responsible for measuring the following parameters are still not provided: 1. Qww,y 2. ECy 3. Qww,runoff **CL remains open**				
Project participant response				**Date :** 25/09/2019
Calibration details were included in each parameter.				
Documentation provided by project participant				
190925_Monitoring report_Palmeras_v3.docx				
DOE assessment				**Date:** 30/09/2019

Information regarding the following meters were included:

- Qww,y – There are two meters that measure the parameter: the contingency and the irrigation. The sum of both gives the parameter's value. The installed meters were calibrated as follows:

Contingency	Irrigation
S/N: 06110635 – Calibration: 09/06/2011	S/N: 05118633 – Calibration: 21/05/2011
S/N: 11122019 – Calibration: 11/09/2019	S/N: 11122019 – Calibration: 11/09/2019

- ECy:

Main	Backup
S/N: 17014280 – Calibration: 16/09/2019	S/N: 15220400 – Calibration: 16/09/2019

- Qww,runoff – It is observed that no calibration certificates were provided for this flow meter

S/N: 11122013

As a result, for the parameter Qww,y the correction factor has been applied for the whole monitoring period conservatively
For the parameter ECy, correction factor (max between calibration and maximum permissible) has been applied to be whole monitoring period conservatively
For the parameter Qww,runoff, the correction factor has been applied for the whole monitoring period conservatively

The measures are in accordance with VVS for PA version 2.0 para 366 which is conservative.

CL is closed

CL ID	02	**Section no.**	E.6.2	**Date :** 18/07/2019
Description of CL				
MR section D.2 parameter Qy: values monitored were not reported in the MR.				
Project participant response				**Date :** 06/09/2019
Values monitored were included in MR section D.2 parameter Q_y				
Documentation provided by project participant				
190910_Monitoring report_Palmeras.docx				
DOE assessment				**Date:** 11/09/2019
The values presented in the MR are the values for compost destined to fields, which is not the same as the amount of waste prevented from disposal in SDWS (EFB). **CL remains open**				
Project participant response				**Date :** 17/09/2019
The values were corrected according to the supporting document "System Screen Record…(EFB / FFB).pdf".				
Documentation provided by project participant				
190925_Monitoring report_Palmeras_v3.docx				
DOE assessment				**Date:** 30/09/2019
Correct values have now being reported in the MR. **CL is closed**				

CL ID	03	**Section no.**	E.6.2	**Date :** 18/07/2019
Description of CL				
MR section D.2: *1. The cross-check measures detailed in the PDD are not being demonstrated for the following parameters: Qy, Qww,y, $FC_{diesel,y}$.*				
Project participant response				**Date :** 06/09/2019
Cross-checking measures presented for the defined parameters are provided in the supporting document: "Cross-check measures_Qy, Qww,y, FCdiesel,y.xlsx"				

Documentation provided by project participant	
Cross-check measures_Qy, Qww,y, FCdiesel,y.xlsx	
DOE assessment	**Date:** 11/09/2019
The PP presented cross-check measures for the above parameters. The following has been observed. 1. Qy: it seems that parameter Qy is being considered as compost instead EFB (empty fruit bunches or raquis prensado in Spanish) thus, clarification is required. 2. Qww,y: it seems that the values of EFB are being considered as FFB. 3. FC diesel: the values used for diesel in 2016, 2017 and 2018 in the cross-check file are correspondent to 2017, 2018 and 2019 as per information provided during site visit. **CL remains open**	
Project participant response	**Date :** 17/09/2019
Cross-checking measures was corrected and updated.	
Documentation provided by project participant	
190925_Monitoring report_Palmeras_v3.docx	
DOE assessment	**Date:** 30/09/2019
1. The parameter Qy is correctly reported in the Cross-check spreadsheet. The proportion EFB/FFB obtained during this period is between 11% and 15%. The value is relatively lower when compared to the information provided in the PDD (23%). It means that less waste (EFB) was generated and consequently the site remains able to accommodate the waste for the duration of crediting period, which is an applicability criteria of the AMS- III.F (point 8). 2. POME (Qyy) is being correctly reported in the Cross-check spreadsheet. The results for the period are between 0.75 and 1.28 m^3 POME/ton of FFB, which is within the estimated in the PDD (0.8 m^3/ton). Only cross-check values for 2013 to 2015 were calculated due to lack of monitored data in other years. 3. Correct values are now reported in the Cross-check calculations. The most conservative values were applied in the PE calculations. **CL is closed**	

CL ID	04	Section no.	E.6.2	Date : 18/07/2019
Description of CL				
No evidence has been provided for the following parameters: *1. Qww,y – values from 2018 to 2019 were not provided.* *2. Not all evidences of BOD and COD analysis results applied in the ER calculations between 2013 and 2015 were presented to the verification team and no evidences from 2016 to 2019 were provided at all* *3. ECy between January and February 2016 is missing* *4. O2 measurements (for determining parameter Qy,portion) between 01/01/2017 and 31/05/2019* *5. Qww,runoff – values from 2016 to 2019 were not provided.*				
Project participant response				**Date :** 06/09/2019
1. During the period from 25/08/15 to 31/05/19 the parameters $Q_{ww,y}$ and $Q_{ww,runoff}$ were not constantly monitored. For this period, the following conservative assumption was made: the smallest monthly amount of the POME from measurements (2013-2015) was applied. 2. As explained in the verification visit and in the adjusted monitoring report, the target precision level of 10% is not achieved during the monitoring period and additional sampling is not possible in a retroactive manner; thus the conservative procedure proposed in the implementation plan of the Sampling Plan for Chemical Oxygen Demand in the PDD is applied. This consists of discounting or added the difference between the resulting relative precision and the target one. Between 2016 and 2019 sampling by nationally accredited external laboratory missing, so for this period the most conservative value of all samples made in previous years was applied. 3. For January and February 2016, there is a data gap in the power consumption from the compost plant. As a conservative approach, the maximum possible power consumption based on the capacity of the project equipment was estimated for this period and used for the determination of project emissions. 4. 14,686 samples were taken during the monitored period, exceeding the target sample size. There was not waste material composted in the presence of less than 8% oxygen.				
Documentation provided by project participant				

1. *190910_CERs calculation_Palmeras de la Costa.xlsx*
2. *190910_Monitoring report_Palmeras.docx*
3. *Folder: Qy (EFB-FFB)_Qww in-runoff_records*
4. *Folder: BODinflow,y & CODy,ww,runoff samples*
5. *Technical specifications power consumption Composting plant.xlsx*
6. *Oxygen measurements minor 8% (Sampling Q,y,portion).xlsx*

DOE assessment | **Date:** 11/09/2019

1. Considering that no data is available, it is not clear whether the project is operating during this period and consequently if the values informed (even being the smallest during the monitoring period) are actually conservative.
2. Between 2013 and 2015, all available BOD and COD analysis were made available to the verification team. As detailed in the PDD section A4.3, in case target precision is not achieved, the measure detailed above is to be carried out. However, the monitoring plan has not been followed as the minimum samples (at least 30 per MP) has not being achieved.
3. This measure is considered conservative. However its explanation is not included as temporary deviation of the MP in section B.2.1 of the MP.
4. It is agreed that more than required samples were taken between 2013 and 2016. However, no single information from 2017 onwards was provided. Thus, it is not possible to attest that during the period 2017-2019 the compost was controlled as per monitoring plan and the oxygen portion was kept above 8%.
5. Regarding the parameter Qww,runoff, even though the measure is conservative, detailed explanation is missing in the section B.2.1 of the MR.

CL remains open

Project participant response | **Date :** 26/09/2019

1. As a guarantee of the suitable use of POME in composting piles, Palmeras de la Costa must demonstrate compliance with Res. 1207 of 2014, where technical and legal criteria are determined for the permitted reuse of wastewater from industrial processes in the use of agricultural processes (plantation fertilizer). See explanation in the MR.
2. Since a minimum of 30 **BOD_{inflow}** and **$COD_{y,ww,runoff}$** samples are not achieved during the monitoring period, a statistical analysis was made with the Student's t-test, which is usually used in the verification of means of samples less than 30. This t-test allowed to determine that the sample size made can be considered statistically significant. See explanation in the MR and - ER calculations spreadsheet tab “t-Student analysis”.
3. Explanation was included as temporary deviation of the MP in section B.2.1 of the MR.
4. It was applied a correction factor of 50% as the most conservative assumption possible for a portion of waste material that is composted in the presence of less than 8% oxygen during the non-conforming MP.
5. Explanation was included as temporary deviation of the MP in section B.2.1 of the MR.

Documentation provided by project participant

- *190925_Monitoring report_Palmeras_v3.docx*
- *190923_CERs calculation_Palmeras de la Costa.xlsx*

DOE assessment | **Date:** 30/09/2019

1. A post registration change (temporary deviation) has been requested, considering that it is demonstrated that the irrigation process is operational even though monitoring data are not available. The PP is proposing an alternative monitoring. Refer to Post Registration Changes Validation report attached to this report for full assessment.
2. A temporary deviation has been requested applying conservative assumptions to the parameters COD and BOD taking into account that the minimum samples required were not achieved for the monitoring period. Refer to Post Registration Changes Validation report attached to this report for full assessment
3. Duly explanation has been included in section B.2.1 of the MR. For further assessment, refer to Post Registration Changes Validation report attached to this report
4. A temporary deviation has been requested applying conservative assumptions to the parameter Qy portion taking into account that the samples were not conducted between 2017 and 2019. Refer to Post Registration Changes Validation report attached to this report for full assessment.
5. Duly explanation has been included in section B.2.1 of the MR. For further assessment, refer to Post Registration Changes Validation report attached to this report

CL is closed

CL ID	05	**Section no.**		**Date :** 19/07/2019

Description of CL	
Section E.1, E.2, sample calculation for all formulae applied in the BE and PE were not included as required by instructions for completing the MR.	
Project participant response	**Date :** 06/09/2019
Sample calculation for all formulae applied were included in MR.	
Documentation provided by project participant	
190910_Monitoring report_Palmeras.docx	
DOE assessment	**Date:** 11/09/2019
Information was duly included in the MR as per instructions for completing the MR> **CL is closed**	

CL ID	06	Section no.	E.8.5	Date : 18/07/2019
Description of CL				
The estimated ERs presented in the MR front page and section E.5 are not in accordance with the ones obtained in the registered PDD.				
Project participant response				**Date :** 06/09/2019
Estimated ERs in the MR front page was updated.				
Documentation provided by project participant				
190910_Monitoring report_Palmeras.docx				
DOE assessment				**Date:** DD/MM/YYYY
The estimated values are now in accordance with the registered PDD. Duly explanation is being given in the section E.5.1 of the MR. **CL is closed**				

Table 3. CAR from this verification

CAR ID	01	Section no.	E.6.3	Date : 18/07/2019
Description of CAR				
1. *Considering that the minimum samples were not reached for all years for parameters BOD and COD, the sampling procedure has not being followed as per PDD section A.4.3 – "Failure to achieve the target precision level".* 2. *Moreover, no information has been detailed regarding the sampling results for parameters BOD, COD and Qy,portion in section D.3 of the MR as required by the information for completing the MR.*				
Project participant response				**Date :** 06/09/2019
1. *The sampling procedure has been corrected.* 2. *The information required has been detailed in section D.3 of the MR.*				
Documentation provided by project participant				
190910_Monitoring report_Palmeras.docx				
DOE assessment				**Date:** 06/09/2019
1. The fact that the minimum samples were not reached for the monitoring period is not previewed by the registered PDD. It is clearly said in the PDD section A4.3 that the conservative approach is only applicable in case of target precision level (10%) is not achieved. But this measure is not referred to number of samples to be taken. Thus, the parameter was not measured in accordance with monitoring plan and no information was included in the section B.2.1 of the MR. 2. Duly information has been included in the section D.3 of the MR. **CL remains open**				
Project participant response				**Date :** 26/09/2019
1. Since a minimum of 30 $\mathbf{BOD_{inflow}}$ and $\mathbf{COD_{y,ww,runoff}}$ samples are not achieved during the monitoring period, a statistical analysis was made with the Student's t-test, which is usually used in the verification of means of samples less than 30. This t-test allowed to determine that the sample size made can be considered statistically significant. See explanation in the MR and - ER calculations spreadsheet tab "t-Student analysis". Explanation was included as temporary deviation of the MP in section B.2.1 of the MR.				
Documentation provided by project participant				
- *190925_Monitoring report_Palmeras_v3.docx* - *190923_CERs calculation_Palmeras de la Costa.xlsx*				
DOE assessment				**Date:** 30/09/2019

1. A temporary deviation has been requested applying conservative assumptions to the parameters COD and BOD taking into account that the minimum samples required were not achieved for the monitoring period. Refer to Post Registration Changes Validation report attached to this report for full assessment **CAR is closed**

Table 4. FAR from this verification

FAR ID	xx	**Section No.**		**Date:** DD/MM/YYYY
Description of FAR				
Project participant response				**Date:** DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				**Date:** DD/MM/YYYY

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Document information

Version	*Date*	*Description*
03.0	31 May 2019	Revision to: • Ensure consistency with version 02.0 of the "CDM validation and verification standard for project activities" (CDM-EB93-A05-STAN); • Make structural and editorial improvements.
02.1	11 January 2018	Editorial revision to correct the numbering of appendices in the instructions.
02.0	31 October 2017	Revision to align with the requirements of the "CDM validation and verification standard for project activities" (version 01.0).
01.0	23 March 2015	Initial publication.

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