Monitoring Report	
Title of the project activity	Avoidance of Methane Emissions at Organic Compost Soil Amendment Facility from GEC Organics
Gold Standard reference number of the project activity	103000000006015
Version number of the monitoring report	3.0
Completion date of the monitoring report	January 23, 2017
Monitoring period number and duration of this monitoring period	1st Monitoring Period January 4, 2015 to December 31, 2015
Project participant(s)	M/s GEC Organics
Host Party	United States of America
Sectoral scope(s)	13 and 15
Selected methodology(ies)	Revised Approved consolidated baseline methodology ACM0010 - "Revised Consolidated baseline methodology for GHG emission reductions from manure management systems and municipal solid waste"
Selected standardized baseline(s)	N/A
Total amount of GHG emission reductions or net GHG removals by sinks achieved in this monitoring period	**5,352 tCO2e**

A. Description of project activity

A.1. Purpose and general description of project activity

The proposed project activity known as “Avoidance of Methane Emissions at Organic Compost Soil Amendment Facility from GEC Organics”, involves aerobic decomposition of chicken manure and green waste (wood shavings) through composting in Castleberry, Alabama in the South-Eastern Region of the United States. The project activity will be undertaken by GEC Organics Corp. (“GECO”), a company that is committed to the development, production and marketing of advanced technologies that address specific environmental challenges, in agriculture.

The proposed project activity is a Greenfield project involving aerobic decomposition of chicken manure and green waste (wood shavings) through composting in Castleberry Alabama in the South-Eastern Region of the United States. The Gold Standard Verified Emission Reduction (GS-VER) project activity has been undertaken by M/s GEC Organics (“GECO”), a company that is committed to the development, production and marketing of advanced technologies that address specific worldwide environmental challenges. The chicken manure and green waste (wood shavings) is purchased from local companies and received at the compositing facility as raw material to produce a high potency organic compost, OSA1000TM that is pathogen free and odourless.

The composting facility has a waste processing capacity of 5000 TPM (tons per month) (chicken manure 4500 TPM + wood shavings 500 TPM) and will process the organic content of waste through windrow composting to produce the final product, organic compost. The entire process of the GS VER project will be as follows:

1. Delivery of Waste
2. Weighing of loaded truck containing waste in weigh bridge scale
3. Formation of Windrows and aerobic decomposition
4. Curing and refinement of treated waste
5. Screening
6. Packing and storage of compost for sale

The combination of material is distributed on 5 windrows 12 feet wide by approximately 1,000 feet in length on 70 acres of leased land. In this project, the combination of the above waste streams are heated to 160 degrees, turned and blended with an all-natural microbe formula over a 30 to 45 day cycle. The result is nutrient rich compost, which is odorless, safe for the environment and will rebuild the soil while retaining moisture.

A.2. Location of project activity

The Project is located in 70 acreage of land at 630 Conecuh County Road, Castleberry Alabama 36432, United States of America (USA). The geo-coordinates of 70 acreage campus (31°19' 23.75'' N / 87°01'22.04'' W). The detail geo-coordinates of the project are mentioned below.

#	Location	Latitude	Longitude
0	Project Area	31° 19' 23.75''N	87° 01' 22.04''W
1	Windrow 1	31° 19' 17.22''N	87° 02' 05.12''W
2	Windrow 2	31° 19' 19.43''N	87° 02' 02.42''W
3	Windrow 3	31° 19' 21.23''N	87° 02' 00.53''W
4	Windrow 4	31° 19' 23.52''N	87° 02' 13.07''W
5	Windrow 5	31°19' 25.31''N	87° 02' 10.44''W

AWMS Site:

The Chicken manure farm is operated by JEB Farms, located at 12773 Mt Zion Rd Ramer, Alabama 36069-5670. The geo-coordinates of the JEB Farms location is (32.048927, -86.152619).

The Green Waste is purchased from Conecuh Timber, located at 1040 Main St, Beatrice, Alabama 36425. The geo-coordinates of the Conecuh Timber location is (31°43'53.0"N 87°12'38.2"W).

B. Parties and project participant(s)

Party involved ((host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate whether the Party involved wishes to be considered as project participant (yes/no)
United States of America (host)	Private entity: GEC Organics	No

B.1. Reference of applied methodology and standardized baseline

Approved "Revised Consolidated baseline methodology for GHG emission reductions from manure management systems and municipal solid waste", (ACM0010), Version 7.0.0

Reference:

This consolidated baseline methodology is based on elements from the following methodologies:

- AM0006: "GHG emission reductions from manure management systems";
- AM0016: "Greenhouse gas mitigation from improved Animal Waste Management Systems in confined animal feeding operations".
- ACM0010: "Revised Consolidated baseline methodology for GHG emission reductions from manure management systems and municipal solid waste", Version 7.0.0
- ACM0022: "Alternative waste treatment processes"
- AM0073: GHG emission reductions through multi-site manure collection and treatment in a central plant --- Version 1.0

This methodology also refers to the latest approved versions of the following tools:

- "Tool to calculate baseline, project and/or leakage emissions from electricity consumption";
- "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion";
- "Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period";
- "Combined tool to identify the baseline scenario and demonstrate additionality";
- "Project and leakage emissions from anaerobic digesters";
- "Project and leakage emissions from composting";
- "Tool to determine the baseline efficiency of thermal or electric energy generation systems";
- "Tool to determine the mass flow of a greenhouse gas in a gaseous stream";
- "Project and leakage emissions from transportation of freight".

B.2. Crediting period of project activity

January 4, 2015 to December 31, 2015

B.3. Contact information of responsible persons/entities

Mr. Peter Ubaldi
GEC Organics
96 Park Street, Montclair New Jersey 07042
Montclair New Jersey

C. Implementation of project activity

C.1. Description of implemented registered project activity

Pre-Project Scenario:

Prior to the implementation of project activity, disposal of the waste i.e. chicken manure in agricultural land without a LFG capture system is the common practice and the same has been identified as most plausible baseline scenario.

Management Systems	Broilers

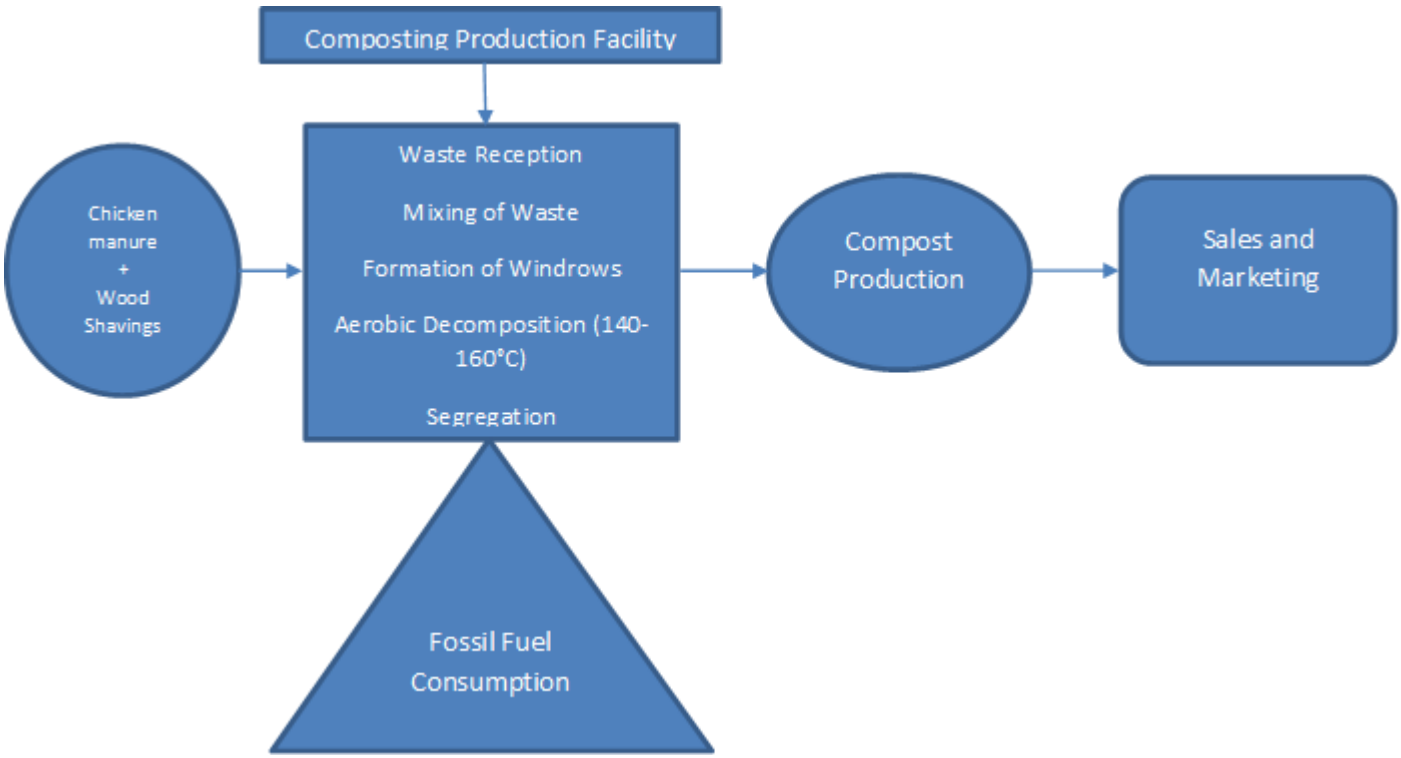
GEC Organics will be the responsible implementing and coordinating agency for the project activity. The compost thus produced will be applied to soil as a soil enricher for agricultural activities. In the absence of the project activity the generated waste would have continued to be dumped in an existing unscientific and ordinary way. This would have resulted in anaerobic decomposition of the waste materials and generation of methane due to anaerobic decay. Implementation of the project activity will thus avoid the emissions of methane by facilitating aerobic decomposition of the wastes and resulting in emission reductions.

The total estimate of GHG emission reductions of the project activity over the crediting period of 10 years is expected to be 2,013,952 tonnes CO_2e respectively.

The project activity involves aerobic treatment of the received material (i.e. chicken manure and green waste). The compost thus produced will be sold to local farmers as a soil enricher for agricultural activities.

Technical Specifications of major equipment used in the project activity:

Windrow Turner	Scarab Composter Make
Engine	TIER II Caterpillar
Drum & Wheel drives	Hydraulic drive systems
Tunnel	18' X 7'
Drum	32'' overall diameter, ½" drum wall thickness
Cab	Air Conditioned, heated, tilt console with controls electric over hydraulic



The technology used in the project activity is available in the Host country and there is no technology transfer. The technology is environmentally safe and sound.

C.2. Post-registration changes

C.2.1. Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline

No deviations have been made from the registered monitoring plan, applied methodology or applied standardized baseline.

C.2.2. Corrections

No Applicable

C.2.3. Changes to start date of crediting period

No changes made to the start date of the crediting period.

C.2.4. Inclusion of a monitoring plan to the registered PDD that was not included at registration

The entire process of composting of fresh waste consists of the following important steps and associated monitoring parameters:

Waste Reception:

The raw material is delivered in trailer loads and is weighed at the on-site scale upon receiving. In some cases it may be more efficient to use an off-site scale as long as evidence of proper calibrations records are obtained and records kept. Weigh bills for the incoming material are maintained and information is documented on the F-02 Receiving Log – Chicken and/or F-03 Receiving Log – Wood. The scale will be calibrated in accordance with the manufacturer's requirements. When certified Calibrations are required, records shall be maintained. Furthermore,

daily calibration checks (for days when the scale is used) for the scale shall be documented on the F-07 Scale Calibration form.

The incoming material is either placed directly onto the windrows or is stored on an open cement pad for no longer than 3 days. Regardless of initial placement, the chicken manure will be treated immediately with a liquid microbe blend to begin the de-odorization and degradation process of the material.

Windrow Formation and Aerobic Decomposition:

A windrow is an open area 12 feet wide and up to 1000 feet in length. The windrows will be sprayed with soil inoculants, a proprietary blend of beneficial microbes and organic microbe growth enhancers to accelerate the decomposition process. After the spray is completed, a combine like machine known as a windrow turner will blend the raw material and begin the heating process for the 30 to 45 day decomposition period. The windrow turner machine will mix and blend each odor free windrow, approximately 3 times per week, and the microbe formula will be added with each turning.

The temperature will be maintained at a minimum of 140-160 degrees during this phase. The temperatures will be taken in each windrow at least twice per week during this process, which will last 30 to 45 days. At a minimum, the temperature measurement shall be monitored and recorded for at least every 150 feet of windrow. The temperature shall be measured no more than 24 inches below the pile surface or below the point where the insulating layer meets the pile surface, if employing a layer of finished compost or other carbonaceous material. Windrow information and temperature measurements shall be documented on the F-05 Windrow Log Info. Calibration of the thermometers will be conducted in accordance with the manufacturer's requirements and will be documented on the F-08 Thermometer Calibration.

At the end of this period, the waste materials will be blended and ready to be moved to the curing pile to cool at the ambient temperature and sprayed again with our soil inoculants. When the pile reaches ambient temperature, it is sufficiently cooled and will be put through a sifting machine.

Segregation:

The produced compost will be fed through a sifting machine for coarse segregation containing a single Screen of approx. 6.35 mm particle size.). The pieces which have not been made small enough to go through a commercial spreader will be put back onto the new windrows. The material that has gone through the sifter machine is now ready for packaging.

Packing:

The high quality compost prepared will then be packaged for sales. Depending on the customer's needs, the weight of pack is as follows; (1) 20 or 40 lb. bags, (2) ½ ton totes, (3) bulk sales by truck load, which will be based on the size of the truck that the customer provides. A full size tractor trailer can hold 25 tons and smaller trucks with as little as 3 tons. Compost sales shall be recorded on a sales invoice and applicable information documented on the F-04 Compost Sold form.

In the project activity, minimum of surface water run-off is generated. This run off water goes to retention ponds including storm water, which are fed from drain. This is constructed around the perimeter of the property's operational areas. After that it naturally drains as per topography towards the adjacent creek.

C.2.5. Permanent changes from registered monitoring plan, applied methodology or applied standardized baseline

No changes applicable.

C.2.6. Changes to project design of registered project activity

No changes applicable.

C.2.7. Types of changes specific to afforestation or reforestation project activity

No changes applicable.

D. Description of monitoring system

In order to quantify the GHG reductions from a composting project, the project develop will accurately measure the quantity of incoming waste delivered to the composting operation, by waste stream. The project developer will also monitor and record each shipment of waste delivered to the operation using an onsite scale and/or commercial receipts. The compost operation will keep a daily log showing:

- Date and time of all deliveries of material to the operation
- The weight of each delivered incoming waste stream
- The source of each delivered incoming waste stream

In addition, the project developer will retain all weigh scale receipts generated either on or offsite indicating the weight and source of all delivered material to the operation. This information will be used to aggregate the weight of eligible food and soiled paper waste delivered to the site from each eligible waste stream.

All weigh scales used for project activities must be inspected and calibrated in accordance with manufacturer's specifications. The on-site scale will also be verified daily, when used, with a known, calibrated weight. In the event that an off-site scale is used, the project may document incoming waste weight using commercial receipts from offsite scales. Calibration records for off-site scales shall also be maintained to demonstrate accuracy of scale(s).

D.1. Time, Temperature, and Turning Frequency BMP Monitoring

Temperature:

At a minimum, temperature shall be monitored and recorded at least once a day during the period that the temperature is required to be maintained at or above 140°F. For Turned Windrow Systems, at a minimum, each operation shall monitor and record a temperature measurement for every 150 feet of windrow. The temperature shall be measured no more than 24 inches below the pile surface or below the point where the insulating layer meets the pile surface, if employing a layer of finished compost or other carbonaceous material.

Turning Frequency (Turned Windrow Systems):

At a minimum, staff shall monitor and record all turning events for every 150 feet of windrow. The turning record must include, for each turning event, the calendar date and day of the composting cycle on which the turning event occurred. Turning event monitoring and recording shall commence at the start of the active composting cycle, and conclude when the temperature falls below 140°F upon completion of the time and temperature requirements. The windrow turner machine will mix and blend each odour free windrow approximately 3 times per week and the microbe formula will be added with each turning. The temperature will be maintained at a minimum of 140-160 degrees during this phase. The temperatures will be taken in each windrow at least twice per week during this process, which will last 30 to 45 days.

The temperature and turning frequency records will be used to establish the rate of compliance with the Time, Temperature, and Turning Frequency BMP requirements. The project will maintain records to demonstrate the total number of 150 ft. windrow sections and/or 200 cubic yard piles that were formed over the reporting period, and will demonstrate that at least 90% of the windrow sections and/or piles were composted in compliance with the relevant Time, Temperature, and Turning Frequency requirements.

Should a project fail to achieve a 90% compliance rate due to missing or inadequate data, or due to failure of a portion of the system to meet Time, Temperature, and Turning Frequency BMP requirements, the project developer will discount the baseline calculation by a percentage equal to the actual rate of compliance as demonstrated by the available data over the reporting period in question.

D.2. Waste Handling BMP Monitoring

To demonstrate compliance with the Waste Handling BMP requirements, the project developer will record, as part of the daily log:

- The date and time that each delivered waste stream is mixed and incorporated into the composting process;
- The type of carbonaceous material applied to the waste delivered to the operation (if any); and
- The date and time that carbonaceous cover material is applied to the waste delivered to the operation (if applicable).

D.3. Monitoring Parameters

Monitoring parameters for the project include:

Calibration /maintenance of the measuring instruments

There is one on-site scale used for weighing of incoming and outgoing material and five thermometers used for measuring the temperature of the windrows during the composting process. Scale calibrations to be documented on the F-07 Scale Calibration form. Thermometer Calibrations to be documented on the F-08 Thermometer Calibration form.

Instrument	Frequency	Calibration Date
Scale	Daily Use	Turner Scale: 1/2/2015 See Calibration Records
Thermometer 1	Daily Use	See Calibration Records
Thermometer 2	Daily Use	See Calibration Records
Thermometer 3	Daily Use	See Calibration Records
Thermometer 4	Daily Use	See Calibration Records
Thermometer 5	Daily Use	See Calibration Records

In this monitoring period, no malfunction occurred for the above-mentioned measuring instruments, so there are no the corresponding repair records.

Incoming Weight of Raw Material

Incoming weight of raw material is to be documented on the F-02 Receiving Log – Chicken Litter or the F-03 Receiving Log – Wood.

Type of Raw Material	Total Weight for Crediting Period
Total Chicken Manure	1296.79
Wood and Wood Products	129.68
Total Weight of Raw Materials	**1426.47**

Monitoring of Compost Activities

Monitoring of compost activities shall include, windrow log information (e.g. start date/time, end date/time, thermometer readings, dimensions of windrows, etc.). Windrow log information shall be documented on the F-05 Windrow Log Info form.

Fuel Consumption

Fuel consumed during project activity shall be monitored through invoices and/or receipts. Fuel consumption shall be documented on the F-06 Fuel Consumption form.

D.4. Reporting Parameters

For purposes of independent verification and historical documentation, GECO will keep all information outlined in this protocol for a period of 10 years after the information is generated or 7 years after the last verification.

System information retained by GECO, includes:

- All data inputs for the calculation of the project emission reductions, including all required sampled data;
- Copies of all permits, Notices of Violations (NOVs), and any relevant administrative or legal consent orders dating back at least 3 years prior to the project start date;
- Executed Attestation of Title forms, Attestation of Regulatory Compliance forms and Attestation of Voluntary Implementation forms;
- Onsite weigh station calibration results;
- Waste delivery receipts and records;
- Daily logs detailing weight and source of all incoming waste streams;
- Compost BMP and OPC monitoring data;
- Onsite fossil fuel use records;
- Onsite grid electricity use records;
- Results of CO_2e annual reduction calculations;
- Initial and annual verification records and results;
- All maintenance records relevant to the composting equipment and monitoring equipment.

E. Data and parameters

E.1. Data and parameters fixed ex ante or at renewal of crediting period

Data / Parameter	$R_{VS,n}$
Data unit	Data unit: Fraction
Description	Description: Fraction of volatile solid degraded in AWMS treatment method *n* of the *N* treatment steps prior to waste being treated
Source of data	N/A
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of Data	N/A
Comments	

Data / Parameter	$R_{VS,n}$
Data unit	Data unit: Fraction
Description	Description: Fraction of volatile solid degraded in AWMS treatment method *n* of the *N* treatment steps prior to waste being treated
Source of data	N/A
Value applied:	N/A
Justification of choice of data or description of measurement methods and procedures applied	N/A
Purpose of Data	N/A
Comments	

Data / Parameter	**MCF**
Data unit	Unitless
Description	Methane correction factor
Source of data	IPCC 2006 Guidelines for National Greenhouse Gas Inventories
Value applied:	1.5% = dry lot, 4.0% = solid storage, 0.5% = spreading, 0.005 = composting

Justification of choice of data or description of measurement methods and procedures applied	The conservative value among all the values has been chosen for the calculations.
Purpose of Data	For calculating the Baseline emission
Comments	As per the methodology ACM0022, version1, "MCF accounts for the fact that unmanaged SWDS produce less methane from a given amount of waste than managed SWDS, because a larger fraction of waste decomposes aerobically in the top layers of unmanaged SWDS." The SWDS in case of project activity is a managed one with compacting levelling of waste. The data will archived for the entire crediting period and 2 years post crediting period.

Data / Parameter	**$GWPCH_4$**
Data unit	*tCO_2e/tCH_4*
Description	*Global Warming Potential of CH4*
Source of data	*Fourth assessment period of IPCC 2007. http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html*
Value applied:	*25*
Justification of choice of data or description of measurement methods and procedures applied	*The value for second commitment period is considered for the project as per the Point No7 of the Guidelines, "STANDARD FOR APPLICATION OF THE GLOBAL WARMING POTENTIALS TO CLEAN DEVELOPMENT MECHANISM PROJECT ACTIVITIES AND PROGRAMMES OF ACTIVITIES FOR THE SECOND COMMITMENT PERIOD OF THE KYOTO PROTOCOL" EB 69, Annex 3*[1]
Purpose of Data	*For calculating the Baseline emission*
Comments	*The data will archived for the entire crediting period and 2 years post crediting period.*

Data / Parameter	**$EFCH_4$,default**
Data unit	*tCH4/t*
Description	*Default emission factor of methane per tonne of waste composted (wet basis).*
Source of data	*Based on the methodological tool "Project and leakage emission from composting ", Version 01.0.0 , Annex 09, EB 65*
Value applied:	*0.02*
Justification of choice of	*The emission factor was selected based on studying published results of*

[1]http://cdm.unfccc.int/Reference/Standards/meth/reg_stan02.pdf

data or description of measurement methods and procedures applied	*emission measurements from composting facilities, literature reviews on the subject and published emission factors. Data from recent, high quality source and analysed and a value conservatively selected from the higher end of the range in result.*
Purpose of Data	*For calculating the Project emission*
Comments	Applicable to Option 2 in the step "Determination of methane and nitrous oxide emission from the composting process".

Data / Parameter	**EFN_2O,direct**
Data unit	*tN_20/t*
Description	*Default emission factor of methane per tonne of waste composted (wet basis)*
Source of data	CH4 and N2O Emissions from Livestock Manure 2006 IPCC Guidelines for National Greenhouse Gas Inventories.
Value applied:	0.02 = dry lot, 0.02 = solid storage, 0.00 = spreading, 0.01 = composting
Justification of choice of data or description of measurement methods and procedures applied	*Justify the choice of data source, providing references where applicable. Where values are based on measurement, include a description of the measurement methods and procedures applied (e.g., what standards or protocols have been followed), indicate the responsible person/entity that undertook the measurement, the date of the measurement and the measurement results. More detailed information may be provided in an appendix.*
Purpose of Data	*For calculating the Project emission*
Comments	*Applicable to Option 2 in the step "Determination of methane and nitrous oxide emission from the composting process".*

Data / Parameter	**$GWPN_2O$**
Data unit	*tCO_2e/tN_2O*
Description	*Global Warming Potential of N_2O*
Source of data	*Forth assessment period of IPCC 2007 for second commitment period of Kyoto protocol.* *http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch2s2-10-2.html*
Value applied:	*298*
Justification of choice of data or description of measurement methods and procedures	*The value for second commitment period is considered for the project as per the Point No 7 of the Guidelines "STANDARD FOR APPLICATION OF THE GLOBAL WARMING POTENTIALS TO CLEAN DEVELOPMENT MECHANISM PROJECT ACTIVITIES*

applied	*AND PROGRAMMES OF ACTIVITIES FOR THE SECOND COMMITMENT PERIOD OF THE KYOTO PROTOCOL" EB 69, Annex 3*[2]
Purpose of Data	*For calculating the Project emission*
Comments	*The data will archived for the entire crediting period and 2 years post crediting period.*

Data / Parameter	$EF_{N2O, D,j}$
Data unit	kg N_2O-N/kg N
Description	Direct N_2O emission factor for the treatment system *j* of the manure management system
Source of data	Estimated with site-specific, regional or national data if such data is available, otherwise use default EF_3 from table 10.21, chapter 10, volume 4, in the IPCC 2006 Guidelines for National Greenhouse Gas Inventories
Value applied:	.04 = dry lot, .001 = solid storage, 0.02 = spreading, 0.01 = composting
Justification of choice of data or description of measurement methods and procedures applied	*Based on common management system practices in the state of Alabama.*
Purpose of Data	*For calculating the Project emission*
Comments	*The data will be archived for the entire crediting period and 2 years post crediting period.*

Data / Parameter	$EF_{N2O,ID}$
Data unit	kg N_2O-N/kg NH3-N and NO_X-N
Description	Indirect N_2O emission factor for N_2O emissions from atmospheric deposition of nitrogen on soils and water surfaces
Source of data	Estimated with site-specific, regional or national data if such data is available. Otherwise, default values for EF_4 from table 11.3, chapter 11, volume 4 of IPCC 2006 Guidelines for National Greenhouse Gas Inventories can be used
Value applied:	*0.01*
Justification of choice of data or	*Based on IPPC values*

[2]http://cdm.unfccc.int/Reference/Standards/meth/reg_stan02.pdf

description of measurement methods and procedures applied	
Purpose of Data	*For calculating the Project emission*
Comments	*The data will be archived for the entire crediting period and 2 years post crediting period.*

Data / Parameter	$F_{gasMS,j,LT}$
Data unit	Fraction
Description	Default values for nitrogen loss due to volatilisation of NH_3 and NO_X from manure management
Source of data	IPCC 2006 Guidelines. Volume 4, Chapter 10 - Table 10.22
Value applied:	*0.4*
Justification of choice of data or description of measurement methods and procedures applied	*Based on IPPC values*
Purpose of Data	*For calculating the baseline emission*
Comments	*The data will be archived for the entire crediting period and 2 years post crediting period.*

Data / Parameter	F_{gasm}
Data unit	Fraction
Description	Fraction of N lost due to volatilization
Source of data	Estimated with site-specific, regional or national data if such data is available. Otherwise, default values from table 11.3, chapter 11, volume 4 of IPCC 2006 guidelines can be used
Value applied:	*0.05*
Justification of choice of data or description of measurement methods and procedures applied	*Based on IPPC values*
Purpose of Data	*For calculating the baseline emission*
Comments	*The data will be archived for the entire crediting period and 2 years post crediting period.*

Data / Parameter	EF_1, EF_4, EF_5
Data unit	kg N_2O-N/kg N for EF_1, EF_5 and [kg N_2O-N/ (kg NH_3-N and

	NO_X-N) for EF_4
Description	Emission factor for N_2O emissions from N inputs; from N leaching and runoff; from atmospheric deposition of N on soils and water surfaces
Source of data	Estimated with site-specific, regional or national data if such data is available
Value applied:	*0.01 = EF1, 0.01 = EF4, 0.0075 = EF5*
Justification of choice of data or description of measurement methods and procedures applied	*Based on IPPC values*
Purpose of Data	*Calculating baseline and project emissions*
Comments	IPCC 2006 Guidelines default values may be used, if country specific or region specific data are not available. EF_1 from table 11.1, chapter 11, volume 4. EF_4 and EF_5 from table 11.3, chapter 11, volume 4

Data / Parameter	$MS\%_{Bl,j}$
Data unit	Fraction
Description	Fraction of manure handled in system *j* in the baseline
Source of data	Project proponents
Value applied:	*100*
Justification of choice of data or description of measurement methods and procedures applied	*All manure baseline scenearios and project scenario are the same.*
Purpose of Data	*Calculating baseline and project emissions*
Comments	IPCC 2006 Guidelines default values may be used, if country specific or region specific data are not available. EF_1 from table 11.1, chapter 11, volume 4. EF_4 and EF_5 from table 11.3, chapter 11, volume 4

Data / Parameter	D_{CH4}
Data unit	t/m_3
Description	Density of CH_4
Source of data	Technical literature

Value applied:	0.00067 t/m_3
Justification of choice of data or description of measurement methods and procedures applied	*Based on IPPC values*
Purpose of Data	*Calculating baseline and project emissions*
Comments	0.00067 t/m_3 at room temperature 20$_o$C and 1 atm pressure

Data / Parameter	MCF_d
Data unit	---
Description	Methane conversion factor for leakage calculation assumed to be equal 1
Source of data	*IPCC values*
Value applied:	*N/A*
Justification of choice of data or description of measurement methods and procedures applied	
Purpose of Data	
Comments	

Data / Parameter	MCF_j
Data unit	---
Description	Methane conversion factor for the baseline $AWMS_j$
Source of data	IPCC 2006 table 10.17, chapter 10, volume 4 (see appendix 3)
Value applied:	1.5% = dry lot, 4.0% = solid storage, 0.5% = spreading, 0.005 = composting
Justification of choice of data or description of measurement methods and procedures applied	The conservative value among all the values has been chosen for the calculations.
Purpose of Data	*For baseline and project emission calculations*
Comments	MCF values depend on the annual average temperature where the anaerobic manure treatment facility in the baseline existed. For average annual temperatures below 10 $_o$C and above 5 $_o$C, a linear interpolation should be used to estimate the MCF value at the specific temperature assuming an MCF value of 0 at an annual average of 5 $_o$C.

	Future revisions to the IPCC Guidelines for National Greenhouse Gas Inventories should be taken into account; □□A conservativeness factor should be applied by multiplying MCF values (estimated as per above bullet) with a value of 0.94, to account for the 20% uncertainty in the MCF values as reported by IPCC 2006

Data / Parameter	$W_{default}$
Data unit	Kg
Description	Default average animal weight of a defined population
Source of data	IPCC 2006 or US-EPA, whichever is lower
Value applied:	*Broilers = 0.9 kg*
Justification of choice of data or description of measurement methods and procedures applied	*Based on IPCC values*
Purpose of Data	*For calculating the baseline emission*
Comments	

Data / Parameter	$VS_{default}$
Data unit	kg –kg VS/ day/1000 kg animal mass
Description	Default value for the volatile solid excretion per day on a dry-matter basis for a defined livestock population
Source of data	IPCC 2006 or US-EPA, whichever is lower
Value applied:	*Broilers = 15*
Justification of choice of data or description of measurement methods and procedures applied	*Based on IPCC values*
Purpose of Data	*For calculating the baseline emission*
Comments	---

Data / Parameter	$NEX_{IPCCdefault}$
Data unit	kg N/animal/year
Description	Default value for the nitrogen excretion per head of a defined livestock population

Source of data	IPCC 2006 or US-EPA
Value applied:	*N/A*
Justification of choice of data or description of measurement methods and procedures applied	
Purpose of Data	*For calculating the baseline emission*
Comments	This parameter is used to estimate $NEX_{LT,y}$ in appendix 2

E.2.Data and parameters monitored

Data / Parameter	Wx or Wi
Unit	Tonne
Description	Total amount of waste disposed or prevented from baseline scenario in year x or month i
Source of data	Measurement is done by project participants and record will be maintained in log books
Value(s) Applied	1296.79 tons – Chicken Manure 129.68 tons – green waste
Measurement methods and procedures	Measurement is done on wet basis for every incoming waste carrying vehicle by an electronic weigh-bridge and recorded electronically and manually
Monitoring frequency	Continuously, aggregated at least annually for year x or monthly for month i
QA/QC procedures	Calibration frequency: In accordance with stipulation of the weighing device supplier. Accuracy Class: As per manufacturer's specification
Purpose of data	For calculating the baseline emission
Additional Comment	All data will be archived for two years post the end of the crediting period

Data / Parameter	**Qy**
Data unit	Tonne/yr
Description	Quantity of waste composted in composting in year y (wet basis).
Source of data	Plant records
Value(s) applied:	1426.47 tons
Measurement methods and procedures	Measurement is done by an electronic weigh-bridge and recorded electronically and manually
Monitoring Frequency	Continuously, aggregated at least annually for year x or monthly for month i
QA/QC procedures	Calibration frequency: As per manufacturer's specification Accuracy Class: As per manufacturer's specification
Purpose of data	For calculating the project emission
Additional Comment	Applicable to Option 1 in the step "Determination of the

	quantity of waste composted". The parameter corresponds to the quantity of solid waste delivered to the composting installation, weighed on a wet basis. All data will be archived for two years post the end of the crediting period.

Data / Parameter	T
Unit	°C
Description	Annual Average ambient temperature at project site
Source of data	Project proponents
Value(s) applied:	18
Measurement methods and procedures	Monitor temperature for site location on a monthly basis using NOAA.org
Monitoring frequency	Monthly
QA/QC Procedures	Documented on the F-10 Ambient Temperature Form
Purpose of Data	Calculation of baseline and project emissions
Additional Comment	Used to select the annual MCF from IPCC 2006 guidelines

Data / Parameter	F_{Aer}
Unit	Fraction
Description	Fraction of volatile solids directed to aerobic treatment
Source of data	Only project activity is passive windrow
Value(s) applied:	100%
Measurement methods and procedures	On-site verification
Monitoring frequency	Annually
QA/QC Procedures	N/A
Purpose of Data	Calculation of project emissions
Additional Comment	N/A

Data / Parameter	**MS%j**
Unit	Fraction
Description	Fraction of manure handled in system j in the project activity
Source of data	Project proponents
Value(s) applied:	100%
Measurement methods and procedures	N/A
Monitoring frequency	Annually

QA/QC Procedures	N/A
Purpose of Data	N/A
Additional Comment	N/A

Data / Parameter	**$NEX_{LT,y}$**
Unit	kg N/animal/year
Description	Annual average nitrogen excretion per head of a defined livestock population estimated as described in appendix 2
Source of data	Refer to appendix 2; Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories
Value(s) applied:	0.6
Measurement methods and procedures	N/A
Monitoring frequency	Annually
QA/QC Procedures	N/A
Purpose of Data	Calculation of baseline emissions
Additional Comment	When using equation 2 in appendix 2, please refer to above guidance for estimating W_{site}

Data / Parameter	nd_y
Unit	Number
Description	Number of days treatment plant was operational in year *y*
Source of data	Project proponents
Value(s) applied:	365
Measurement methods and procedures	Days per annum
Monitoring frequency	Daily
QA/QC Procedures	N/A
Purpose of Data	Calculation of baseline and project emissions
Additional Comment	N/A

Data / Parameter	**FCi,j,y**
Unit	Mass or volume units of fuel
Description	Fuel consumption on-site during year y of the crediting period
Source of data	Onsite measurements
Value(s) applied:	620 gallons of diesel

	0 litres of gasoline
Measurement methods and procedures	Ruler gauge shall be used to determine mass or volume of the fuel consumed, with the following conditions: The ruler gauge must be part of the daily tank and calibrated at least once a year and have a book of control for recording the measurements. Data is cross-checked based on invoices and archived electronically and manually.
Monitoring frequency	Continuously
QA/QC Procedures	The ruler gauge shall be calibrated atleast once a year and the data shall be cross-checked with the purchased invoices. Accuracy Class: As per manufacturer's specification
Purpose of Data	Calculation of project emissions
Additional Comment	This parameter includes diesel + gasoline used waste treatment process in preparation of compost. All data will be archived for two years post the end of the crediting period.

Data / Parameter	pn,i,y or pn,j,i
Unit	Weight Fraction
Description	Weight fraction of the waste type j in the sample n collected during the year y or month i
Source of data	Sample measurements by project participants
Value(s) applied:	<table><tr><td>Different components of organic part of the Waste</td><td>% composition by wt</td></tr><tr><td>Wood shavings</td><td>10%</td></tr><tr><td>chicken manure</td><td>90%</td></tr><tr><td>Total</td><td>100%</td></tr></table>
Measurement methods and procedures	Sample the waste composition, using the waste categories j, as provided in the table for DOCj and kj, and each waste fraction shall be weighed. A minimum of three samples shall be undertaken every three months with the mean value valid for year y. The size and frequency of sampling should be statistically significant with a maximum uncertainty range of 10% at a 95% confidence level.
Monitoring Frequency	A minimum of three samples shall be undertaken every three months with the mean value valid for year y
QA/QC procedures	The size and frequency of sampling should be statistically significant with a maximum uncertainty range of 10% at a 95% confidence level.

Purpose of Data	Calculation of baseline emissions
Comments	All data will be archived for two years post the end of the crediting period

Data / Parameter	**$RATE_{Compliance,y}$**
Unit	Fraction
Description	Rate of Compliance with a regulatory requirement to implement the alternative waste treatment t implemented in the project activity.
Source of data	Ex post based on the information (annual report) to be provided by the local environment management authority + email communication if any from ADEM
Value(s) applied:	0%
Measurement methods and procedures	Fraction is calculated as the number of instances of compliance divided by the number of instances of compliance plus non-compliance. The compliance rate is based on the annual reports of Alabama Environment Management Authority.
Monitoring Frequency	Annual
QA/QC procedures	NA
Purpose of Data	For calculation of Baseline Emissions
Comments	Provide any additional comments

Data / Parameter	**NCVi,y**
Unit	TJ/Gg
Description	Net calorific value of diesel consumed for compost processing unit.
Source of data	Table 1.2 of IPCC 2006 of Guidelines of national Greenhouse gas Inventories.
Value(s) applied:	43
Measurement methods and procedures	Default value as per IPCC 2006. Link is given below: http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf
Monitoring Frequency	Any future revision of the IPCC Guidelines shall be taken into account
QA/QC Procedures	Measurement will be taken in line with national/international standards
Purpose of Data	For calculation of Project Emissions

Additional Comment	The data will archived for the entire crediting period and 2 years post crediting period

Data / Parameter	**EF**co_2,i,y
Unit	$kgCO_2/TJ$
Description	CO_2 emission factor for diesel consumed at the MSW processing unit
Source of data	Table 1.4 of IPCC 2006 of guidelines of Greenhouse gas inventories
Value(s) applied:	74800
Measurement methods and procedures	Default value as per IPCC 2006. http://www.ipcc-nggip.iges.or.jp/public/2006gl/pdf/2_Volume2/V2_1_Ch1_Introduction.pdf
Monitoring Frequency	Any future revision of the IPCC Guidelines shall be taken into account
QA/QC Procedures	Measurement will be taken in line with national/international standards
Purpose of Data	For calculation of Project Emissions
Additional Comment	The data will archived for the entire crediting period and 2 years post crediting period

E.3.Sustainability Assessment Monitoring

E.3.1. 'Do no harm' Assessment

Safeguarding principles	**Description of relevance to my project**	**Assessment of my project risks breaching it (low/medium/high)**	**Mitigation measure**
Human Rights			
1. The project respects internationally proclaimed human rights including	The dignity, cultural properties and the economic, social and culture freedom of the participants and local people is not affected. As the programmers is limited to households no industry is involved that could have negative human rights influences.	Low/none	Monthly Compliance Checklist (F-09)

dignity, cultural property and uniqueness of indigenous people. The project is not complicit in Human Rights abuses	The project respects internationally proclaimed human rights including dignity, cultural property. United States is a party to Universal Declaration of Human Rights.[3] http://www.hrw.org/news/2009/07/24/united-states-ratification-international-human-rights-treaties		
2. The project does not involve and is not complicit in involuntary resettlement	The project does not involve any resettlement	Low/none	Monthly Compliance Checklist (F-09)
3. The project does not involve and is not complicit in the alteration, damage or Removal of any critical cultural heritage	The construction and operation of the project will not involve any damage of critical cultural heritage.	Low/none	Monthly Compliance Checklist (F-09)
Labour Standards			
4. The project respects the employees' freedom of association and their right to collective bargaining and is not complicit in restrictions of these freedoms and rights.	The project will strictly comply with Labour Law of the United States, under the supervision of the local administrative department, the local office will strictly respects the employees' freedom of association and their right to collective bargaining and thus the Project is not complicit in restrictions of these freedoms and rights.	Low/none	Monthly Compliance Checklist (F-09)
5. The project does not involve and is not complicit in any form of forced or	The project does not involve in any form forced labour. United states is a party to C 105 Abolition of Forced Labour Convention.[4]	Low/none	Monthly Compliance Checklist (F-09)

[3] http://www.hrw.org/news/2009/07/24/united-states-ratification-international-human-rights-treaties

[4] http://en.wikipedia.org/wiki/Abolition_of_Forced_Labour_Convention

Compulsory labour.	http://en.wikipedia.org/wiki/Abolition_of_Forced_Labour_Convention		
6. The project does not employ and is not complicit in any form of Child labour.	The project does not involve in any form child labour. The United States is the party to Convention 182 (worst form of child labour).[5] https://www.ilo.org/dyn/normlex/en/f?p=1000:11200:3138929239051286::::P11200_INSTRUMENT_SORT:4	Low/none	Monthly Compliance Checklist (F-09)
7. The project does not involve and is not complicit in any form of discrimination Based on gender, race, religion, sexual orientation or any other basis.	The project will strictly comply with Labour Law of the United States, under the supervision of the local administrative department. The Project will protect the rights of staffs, make sure it does not involve and is not complicit in any form of discrimination based on gender, race, religion, sexual orientation or any other basis.	Medium	PP will ensure that there is no gender, sexual and labour discrimination by appropriate checking systems in compliance with local laws and help of local law and order force.
8. The project provides workers with a safe and healthy work environment and is not complicit in exposing workers to unsafe or unhealthy work environments.	The project work profile will not lead risk to any worker for health and safety issues. However Project will strictly comply with Law of the United States on Work Safety, the Project unit shall abide by this Law and other laws and regulations concerning work safety and health. PP has defined a safety rules for all employees. Appropriate measures such as providing safety training to project staff for work safety and health and improving the conditions for it to ensure work safety and health. Thus the Project is not complicit in exposing workers to unsafe or unhealthy work environments. http://www.dol.gov/dol/topic/safety-health/index.htm	Medium	Monthly Compliance Checklist (F-09)
9. The project takes a precautionary	No significant impact of noise, wastewater, air and dust pollution will be caused by the project.	Low	Monthly Compliance

[5] https://www.ilo.org/dyn/normlex/en/f?p=1000:11200:3138929239051286::::P11200_INSTRUMENT_SORT:4

approach in regard to environmental challenges and is not complicit in practices contrary to the precautionary principle.	The project uses biodegradable waste and there is no pollution of groundwater due to leachate. The project will comply with the requirements of local Environment protection Agency. i.e. ADEM.		Checklist (F-09)
10. The project does not involve and is not complicit in significant conversion Or degradation of critical natural habitats, including those that are Legally protected, (b) officially proposed for protection, (c) identified by Authoritative sources for their high conservation value, or (d) recognized As protected by traditional local communities.	The project is using biodegradable waste to produce compost and does not involve not interfere and/or harm any of the protected areas.	Low/none	Monthly Compliance Checklist (F-09)
11. The project does not involve and is not complicit in corruption	The project is private equity investment does not involve any kind of corruption. United States is a party to United Nation Convention against Corruption[6] since 2006 and the OECD Convention on Combating Bribery of Foreign Public Officials in International Business[7]. http://www.unodc.org/unodc/en/treaties/CAC/signatori	Low/none	NA

[6] http://www.unodc.org/unodc/en/treaties/CAC/signatories.html

[7] http://en.wikipedia.org/wiki/OECD_Anti-Bribery_Convention

	es.html http://en.wikipedia.org/wiki/OECD_Anti-Bribery_Convention		
Additional relevant critical issues for my project type	**Description of relevance to my project**	**Assessment of relevance to my project (low/medium/high)**	**Mitigation measure**
	N/A	N/A	N/A

E.3.1. Sustainable Development matrix

Indicator	**Mitigation measure**	**Relevance to achieving MDG**	**Chosen parameter and explanation**	**Preliminary score**
Gold Standard indicators of sustainable development.	**If relevant copy mitigation measure from "do no harm" – table, or include mitigation measure used to neutralise a score of '–'**	**Check www.undp.or/mdg and www.mdgmonitor.org Describe how your indicator is related to local MDG goals**	**Defined by project developer**	**Negative impact: score '-' in case negative impact is not fully mitigated score 0 in case impact is planned to be fully mitigated No change in impact: score 0 Positive impact: score '+'**
Air quality	None	Ensure Environmental Sustainability (Goal 7)	In addition to the greenhouse gases reduction, the project will significantly improve air quality as compared to the baseline scenario. In baseline scenario the bad odour was generated due to anaerobic disposal of	0

			chicken litter and finally spreading in agricultural fields. The project activity itself will produce a low level of local emissions including particulates from the heavy vehicles and machinery for e.g. transportation truck, windrow turner and small gasoline fired engine. However the parameter has been considered as neutral parameter on conservative basis.	
Water quality and quantity	None	Ensure Environmental Sustainability (Goal 7)	There is no significant impact identified on water quality and quantity from the project activity during the project implementation period. Therefore, the indicator is scored neutral for conservativeness.	0
Soil condition	None	Ensure Environmental Sustainability (Goal 7)	No significant impact is identified on Terrestrial Ecology and land use during the project Implementation period. Therefore, the indicator is scored neutral for conservativeness.	0
Other pollutants	None	Ensure Environmental Sustainability (Goal 7)	Low impact may occur from noise during the operation phase. At the working area where there is some level of noise source, such as at the noise generated from heavy vehicles and machinery for e.g. transportation truck, windrow turner and small gasoline fired engine. Health	0

			and safety equipment and rules is strictly required to be used by operators. However, berms have been established which will help reduce the noise levels for those adjacent the project activity. Therefore, the indicator is scored neutral for conservativeness.	
Biodiversity	None	Ensure Environmental Sustainability (Goal 7)	The project would not involve any deterioration to terrestrial ecology and aquatic ecology. Thus no significant impact is identified on biodiversity. Therefore, the indicator is scored neutral for conservativeness.	0
			Subtotal	**+**
Quality of employment	Monthly Compliance Checklist (F-09)	Eradicate Extreme Poverty and Hunger	All employees working in the project site will be employed according to national employment regulations. A health and safety officer is employed onsite, all safety equipment is available and used by personnel. Ongoing training will be provided to staff and skills developed in-house for operation and maintenance for composting. The chosen parameter will be: a) Relevant health and safety precautions taken, and: b) Training given to staff to develop skills.	+

			At present 7 employees are working on site. Appropriate training related to safety procedures will be provided. Therefore, the indicator is considered positive	
Livelihood of the poor	None	Eradicate Extreme Poverty and Hunger	Overall the project will have little impact on eradicating extreme poverty and hunger. The project does give advantage to the local people by providing business opportunities. Therefore, the indicator is scored neutral for conservativeness.	0
Access to affordable and clean energy services	None	Ensure Environmental Sustainability (Goal 7)	The Project is a composting Project hence this indicator is not applicable for project. Therefore, the indicator is scored neutral for conservativeness.	0
Human and institutional capacity	None	MDG-1: Eradicate extreme poverty & hunger	Explanation: Local employment opportunities created by the project will have an impact of income distribution on different Socio-economic groups. Although the project will contribute to income of local people, it is not possible to monitor it, thus a neutral score will be given according to conservativeness principle. Baseline for parameter: Current income situation in the region Impact of other PPs on socio economic	0

			income distributions Future target for parameters. Continuation of the existing situation.	
Quantitative employment and income generation	None	Eradicate extreme poverty and hunger	Chosen parameter：Number of jobs created and the staff salaries paid by the project. Explanation ： The Project activity leads to some employment generation during the construction of the project. In addition, employment and business opportunities are increased.	+
Balance of payments and investment	None	Develop a Global Partnership for Development	The major equipment of the Project was purchased from domestic manufacturer, thus there's no additional requirement for foreign currency payment. As per the PDD, the project has financial barriers. It has no significant effect on further investments into similar project activities. Therefore it scores "0".	0
Technology transfer and technological self-reliance	None	In cooperation with the private sector, make available the benefits of new technologies, especially information and communications.	Explanation: The project, employed technology locally available. Baseline: not applicable Future target for parameters: Not Applicable	0
			Subtotal	**Positive**
Justification choices, data source and provision of references				
Air quality	The Project activity will have positive impacts by the reduction of bad odour and fugitive emissions of methane and other gases as compared to baseline. In the composting process some minor bad odour will be generated and it will produce			

	foul smell due to presence of organic and inorganic compounds in the chicken litter. These organic and inorganic compounds are the agents which affects air quality, soil quality, and biodiversity life. The results of qualitative analysis of compost, PP can determine the effects of compost preparation or process of compost synthesis on air, water and soil and biodiversity. PP will send compost sample of every batch (which is in correlation to raw material feed batch) to certified laboratory and can understand the effects. Reference: For measurement of Bad odour and organic, inorganic compounds the most appropriate reference is American Public Health Association (APHA)[8].
Water quality and quantity	According to the ADEM, the Project has a positively ecological and social effect on the local environment and society. During the project's implementation, there should not be any waste water or pollutants that affect the local water quality and quantity from the project activity. Therefore, the impact is neutral.The indicator is scored 0.
Soil condition	No impact is expected from the project activity with regard to the land use or terrestrial ecology. Hence, the impact is neutral. The indicator is scored 0.
Other pollutants	As per project profile no other pollutants are expected from the project activity and no significantly positive impacts of the project are identified with regard to other pollutants reduction. Hence, the impact is neutral. There is no noise pollution due to project as per local laws of ADEM.
Biodiversity	The project utilizes methane to generate electricity on the landfill site, and does not involve any deterioration to terrestrial ecology or aquatic ecology surrounding it, according to the Initial Environmental Examination report. Thus, there is no expected negative or significantly positive impact from the project activity on biodiversity.
Quality of employment	No negative impacts of the project are identified, in fact the quality of employment and business opportunities are improved. All employees working for the project activity will be employed according to national employment regulations.
Livelihood of the poor	The project does not directly impact the poor, although some low income people are hired as contractors for manual workers in the composting process.

[8] http://www.standardmethods.org/

Access to affordable and clean energy services	The Project is a composting Project hence this indicator is not applicable for project.
Human and institutional capacity	No negative or significantly positive impacts from the project are identified. As the project has no impact on education and skills or gender equality and empowerment, there is no impact on the human and institutional capacity. Labour practices will be conducted in a non-discriminatory manner as per the relevant laws of the United States.
Quantitative employment and income generation	The Project activity leads to some employment generation during the construction of the project. In addition, employment and business opportunities are increased for local people.
Balance of payments and investment	No negative or significantly positive impacts from the project are identified. As per the project activity description and additionality demonstration, the investment was made via group of private equity investors and funds. Moreover, the major equipment was purchased from domestic manufacturer, thus there's no additional requirement for foreign currency payment.
Technology transfer and technological self-reliance	The project, employed technology locally available and conceptualised by GEC Organics.

E.4.Sustainability Monitoring Plan

No	**1**
Indicator	Continuous Inputs & Grievance Mechanism
Mitigation measure	Communication Channel and Corrective Action Process
Repeat for each parameter	
Chosen parameter	*1.* Weekly collection and review of any inputs / grievances received by walk-in, email, phone or comment box. *2.* *Management to review inputs / grievances and determine if a correction / corrective action is necessary.*
Current situation of parameter	No inputs / grievances received to date.
Estimation of baseline situation of parameter	Not Applicable
Future target for parameter	Weekly collection and review of inputs and grievances received.

Way of monitoring	How	Inputs and/or grievances received through walk-ins, email, phone or comment box.
	When	Weekly collection and review
	By who	By Mr. Peter Ubaldi and Operations Manager

No		**2**
Indicator		Quality of the employment
Mitigation measure		Health and Safety Trainings
Repeat for each parameter		
Chosen parameter		1. Number of employees having Health & Safety Trainings *2.* Personal protection equipment's
Current situation of parameter		None
Estimation of baseline situation of parameter		Not Applicable
Future target for parameter		a) Trainings completed b) Provision of workers with required equipment's in line with the Regulations.
Way of monitoring	How	a) Training certificates or records for attendance to the trainings. In the following years, only new trainings will be reported. b) Checking equipment's and procedural documents by DOE on site visit.
	When	a) Once during the first verification
	By who	Assigned technician by Plant Manager or assigned carbon consultant

No	**3**
Indicator	Quantitative employment and income generation
Mitigation measure	NA
Repeat for each parameter	NA
Chosen parameter	Number of employment
Current situation of parameter	During the monitoring period, GECO employed a total of 8 people.

Estimation of baseline situation of parameter		Not applicable
Future target for parameter		Local recruitments
Way of monitoring	How	Social security records of the employees
	When	Annually (Once at the end of the each monitoring period)
	By who	Assigned technician by Plant Manager or assigned carbon consultant

F. Calculation of emission reductions or GHG removals by sinks

F.1. Calculation of baseline emissions or baseline net GHG removals by sinks

The amount of methane that is generated each year ($BECH_4$, SWDS,y tCO_2e) is calculated for each year with the recommended multi-phase model, the First Order Decay (FOD) model.

As per equation

$$BE_{Manure,y} = BE_{CH4,y} + BE_{N2O,y} + BE_{elec/heat,y} \quad (2)$$

Where:

$BE_{manure,y}$	=	Baseline emissions in year y (tCO_2/yr)
$BE_{CH4,y}$	=	Baseline CH_4 emissions in year y (tCO_2/yr)
$BE_{N2O,y}$	=	Baseline N_2O emissions in year y (tCO_2/yr)
$BE_{elec/heat,y}$	=	Baseline CO_2 emissions from electricity and/or heat used in the baseline (tCO_2/yr)

F.1.1. Baseline CH4 Emission Calculations for Manure Treatment

$$BE_{CH4,y} = GWP_{CH4} \times D_{CH4} \times \sum_{j,LT} \left(MCF_j \times B_{0,LT} \times N_{LT} \times VS_{LT,y} \times MS\%_{BL,j} \right) \quad (3)$$

Where:

$BE_{CH4,y}$	=	Baseline CH_4 emissions (tCO_2/yr)
GWP_{CH4}	=	Global Warming Potential (GWP) of CH_4 (tCO_2e/tCH_4)
D_{CH4}	=	Density of CH_4 (t/m^3)
MCF_j	=	Annual methane conversion factor (MCF) for the baseline $AWMS_j$
$B_{0,LT}$	=	Maximum methane producing potential of the volatile solid generated by animal type LT (m^3CH_4/kg -dm)
N_{LT}	=	Annual average number of animals of type LT for the year y (number)
$VS_{LT,y}$	=	Annual volatile solid excretions for livestock LT entering all AWMS on a dry matter weight basis (kg -dm/animal/yr)
$MS\%_{BL,j}$	=	Fraction of manure handled in system j in the baseline
LT	=	Type of livestock
j	=	Type of treatment system

CH4 Manure Treatment Emissions

Baseline Manure Treatment	TAP	Verification Period
Emissions from (A): Chicken Manure CH4	**tCO_2e**	317

F.1.2. Baseline N2O Emission Calculations for Manure Treatment

$$BE_{N2O,y} = GWP_{N2O} \times CF_{N2O-N,N} \times \frac{1}{1000} \times (E_{N2O,D,y} + E_{N2O,ID,y}) \quad (7)$$

Where:

$BE_{N2O,y}$ = Annual baseline N_2O emissions in (tCO_2e/yr)

GWP_{N2O} = Global Warming Potential (GWP) for N_2O (tCO_2e/tN_2O)

$CF_{N2O-N,N}$ = Conversion factor N_2O-N to N_2O (44/28)

$E_{N2O,D,y}$ = Direct N_2O emission in year y (kg N_2O-N/year)

$E_{N2O,ID,y}$ = Indirect N_2O emission in year y (kg N_2O-N/year)

Baseline N2O Emissions

Baseline N2O Emissions	TPA	Verification Period
Emissions from (B): Broilers N2O	**tCO_2e**	4,798

F.1.3. Baseline CH4 Emission Calculations for Manure Transportation

GECO has taken a conservative approach and assumes no emissions due to manure transportation as part of the baseline calculations.

F.1.4. Total Baseline Emissions

Baseline emission calculations:

Parameters	Unit	Value	References
Total amount of waste prevented through baseline manure management systems	TPA	1296.79	Based on raw material purchase invoices per month
Total amount of green waste to be treated	TPA	129.68	Based on raw material purchase invoices per month
Total percentage of chicken manure treated for composting	Percent	100	90% Chicken manure + 10% Wood Shavings
Total amount of waste to be treated for composting	TPA	1,426.47	Based on raw material purchase invoices per month
Conversion rate	Percent	80	DPR of chicken manure
Total amount of compost generated	TPA	1,167.11	Calculated based on the conversion factor of degradable organic waste & the total amount of waste to be composted
Baseline Emission for the crediting period	**tCO_2e**	**5,115**	**Calculated**

Baseline emissions calculated with FOD model:

Description		Total
Avoided waste deposition, processed for composting	**TPA**	1426
Emissions from (A): Broilers CH4	tCO_2e	317
Emissions from (B): Broilers N2O	tCO_2e	4798
Total baseline methane emissions (MBy)	tCO_2e	5115
Verification Period Baseline emissions (BEy)	**tCO_2e**	**7213**

F.2. Calculation of project emissions or actual net GHG removals by sinks

For the project activity, project emissions are as follows:

$$PE_y = PE_{AD,y} + PE_{Aer,y} + PE_{Comp,y} + PE_{N2O,y} + PE_{EC/FC,y} + PE_{Tran,y} + PE_{Storage,y} \quad (12)$$

Where:

PE_y	=	Project emissions in year y
$PE_{AD,y}$	=	Project emissions associated with the anaerobic digester/ co-digestion in year y (tCO_2e/yr)
$PE_{Aer,y}$	=	Project CH_4 emissions from aerobic AWMS treatment (tCO_2e/yr)
$PE_{Comp,y}$	=	Project CH_4emissions from composting/ co-composting (tCO_2e/yr)
$PE_{N2O,y}$	=	Project N_2O emissions in year y (t CO_2/yr)
$PE_{EC/FC,y}$	=	Project emissions from electricity consumption and fossil fuel combustion (tCO_2e/yr)
	=	Project emissions from manure transportation in the year y (tCO_2/yr)
$PE_{Tran,y}$		
$PE_{Storage,y}$	=	Project emissions from manure storage (tCO_2e,yr)

F.2.1. Project emissions associated with the anaerobic digester in year y (PEAD,y)

The project activity does not involve an anaerobic digester.

F.2.2. Project CH4 emissions from aerobic AWMS treatment (PEAer, y)

The project activity does not involve aerobic AWMS treatment.

F.2.3. CH4 Project emissions associated with the composting in the year y (PEComp,y)

$$PE_{Aer,y} = GWP_{CH4} \times D_{CH4} \times 0.001 \times F_{Aer} \times \left[\prod_{n=1}^{N}\left(1 - R_{VS,n}\right)\right] \times \sum_{j,LT}\left(B_{0,LT} \times N_{LT} \times VS_{LT,y} \times MS\%_j\right) + PE_{SI,y} \quad (13)$$

Where:

GWP_{CH4}	=	Global Warming Potential (GWP) of CH_4 (tCO_2e/tCH_4)
$R_{VS,n}$	=	Fraction of volatile solid degraded in AWMS treatment method n of the N treatment steps prior to waste being treated (fraction)
D_{CH4}	=	Density of CH_4 (t/m^3).
F_{Aer}	=	Fraction of volatile solid directed to aerobic system (fraction)
LT	=	Type of livestock

$B_{0,LT}$ = Maximum methane producing potential of the volatile solid generated by animal type LT (m^3CH_4/kg dm)

$VS_{LT,y}$ = Annual volatile solid excretion livestock type LT entering all AWMS on a dry matter weight basis in (kg -dm/animal/yr)

N_{LT} = Annual average number of animals of type LT for the year y (number) as estimated in equation (5.a) or (5.b).

$PE_{S,y}$ = Project CH_4 emissions from sludge disposed of in storage pit prior to disposal during the year y (tCO_2e/yr)

$MS\%_j$ = Fraction of manure handled in system j in the project activity (fraction)

CH4 Emissions from Composting

Project Emissions – Composting	TPA	Verification Period
Emissions from (B): Chicken Manure CH4	**tCO_2e**	7

F.2.4. Project N2O emissions in year y (PEN2O,y)

$$PE_{N2O,y} = GWP_{N2O} \times CF_{N2O-N,N} \times \frac{1}{1000} \times (E_{N2O,D,y} + E_{N2O,ID,y}) \quad (15)$$

Where:

$PE_{N2O,y}$ = Project N_2O emissions in year y (tCO_2/yr)

GWP_{N2O} = Global Warming Potential (GWP) for N_2O (tCO_2e/tN_2O)

$CF_{N2O-N,N}$ = Conversion factor N_2O-N to N_2O (44/28)

$E_{N2O,D,y}$ = Direct N_2O emission in year y (kg N_2O-N/year)

$E_{N2O,ID,y}$ = Indirect N_2O emission in year y (kg N_2O-N/year)

N2O Emissions from Composting

Project Emissions	TPA	Verification Period
Emissions from (C): Chicken Manure N2O	**tCO_2e**	**274**

F.2.5. Project emissions from use of heat and/or electricity (PEelec/heat)

The project activity doesn't consume electricity for composting activity hence ***PE_{elec}*** *is zero.*

The project activity consists of fossil fuel consumption for preparation of compost. The diesel and gasoline are consumed in the project. Hence, the fossil fuel consumption for the entire project site is measured together using fossil fuel purchase invoices.

Fossil Fuel Parameters and CO2 Emissions

Parameter	Description	Unit	Value applied
$PE_{CO2,\ diesel,\ onsite,\ y}$	**Emissions from on-site fuel consumption per year**	**tCO_2**	**7**

F.2.6. Project emissions from manure transportation (PETran)

The project emissions from manure transportation from collection points to the central treatment plant shall be calculated according to the Methodological tool "Project and leakage emissions from transportation of freight".

Activity #	$EF_{CO2,f}$ (g CO2 / t km)	Freight Type	$FR_{f,m}$ (t)	Origin	Destination	$D_{f,m}$ (km)	Vehicle Class
1	129	Chicken Manure	1296.79	JEB Farms	Project facility	133	Heavy
2	129	Green Waste	314.02	Conecuh Timber	Project facility	44	Heavy

$$PE_{Tran} = \sum_{f} D_{f,m} \times FR_{f,m} \times EF_{CO2,f} \times 10^{-6}$$

Parameter	Description	Unit	Value applied
PE_{Tran}	Emissions from manure transportation per year	tCO_2e	23

F.2.7. Project emissions from manure storage (PEStorage,y)

The project activity does not involve manure storage.

F.2.8. Total Project Emissions

Summary of Project emissions (PE_y)

Project Emissions	TPA	Verification Period
Emissions from (A): Fuel	tCO_2e	7
Emissions from (B): PE CH4	tCO_2e	7
Emissions from (B): PE N2O	tCO_2e	274
Emissions from (D): Transportation	tCO_2e	23
Total Project methane emissions	tCO_2e	311
Project emissions (PEy)	**tCO_2e**	**311**

F.3. Calculation of leakage

As there is no production of RDF in the project activity hence ex-ante estimation of leakage emission is considered as zero for 10 years.

Hence, $LE_{ENDUSE,RDF\_SB,y} = 0$

F.4. Calculation of Emission Savings from Elimination of Synthetic Fertilizers

Since the project creates USDA certified organic compost, no synthetic fertilizers will be used in conjunction with the compost. Therefore, the use of the organic compost also reduces the carbon emissions for synthetic fertilizers that would have been used on the agricultural land.

Baseline emission calculations for elimination of synthetic fertilizer:

BEsyn = 0.53 tCO2e / acre

The project activity compost is applied at a rate of 5.91 tCo2e / acre.

= 5.91 tCo2e per acre / (0.53 tCO2e per acre +5.91 tCo2e per acre)

= 8% per tCO2e

Additional amount saved for not using synthetic fertilizer is 8% per tCO2e for the project acitivity compost.

Item	Baseline emissions or baseline net GHG removals by sinks (t CO_2e)	Project emissions or actual net GHG removals by sinks (t CO_2e)	Leakage (t CO_2e)	Emission savings from elimination of synthetic fertilizers (t CO_2e)	GHG emission reductions or net GHG removals by sinks (t CO_2e) achieved in the monitoring period
					Total amount
Total	**5115**	**-311**	**0.0**	**548**	**5352**

F.5. Comparison of actual emission reductions or net GHG removals by sinks with estimates in registered PDD

Item	Values estimated in ex ante calculation of registered PDD	Actual values achieved during this monitoring period
Emission reductions or GHG removals by sinks (t CO_2e)	**8,212**	**5,352**

F.6. Remarks on difference from estimated value in registered PDD

Emission Reduction differences between the values in the PDD and the actual values calculated for this verification period are due to the following:

- Calculations used for year 1 in the PDD were based on the actual total weight of raw material received (chicken manure and green waste). However, once entered into the calculation spreadsheet, the ratio of 90/10 was applied to the total amount instead of keeping with the actual weights for chicken manure and green waste. This issue has been corrected as part of the verification process. See GECO_VER Calcs_2015_v3.

- The baseline transportation emissions for chicken manure and green waste were assumed to be approximately similar to the distance to GECO's facility, since the chicken manure and green waste are used at various locations in Alabama. However, GECO had no evidence to substantiate this. Therefore, as part of the verification process, GECO took a conservative approach and assumed there were no baseline emissions associated with transportation of chicken manure and green waste. Emissions from transportation were only considered for project emissions.

- During the Validation process, EFN2O values provided by a research document were used. However, to be conservative and consistent, the CH4 and N2O Emissions from Livestock Manure document was used.

Appendix 1. Contact information of project participants and responsible persons/entities

Project participant and/or responsible person/ entity	☒ Project participant ☐ Person/entity responsible for completing the CDM-MR-FORM
Organization name	GEC Organics
Street/P.O. Box	96 Park Street
Building	n/a
City	Montclair
State/region	New Jersey
Postcode	07042
Country	United States of America
Telephone	1-973-610-6048
Fax	
E-mail	peterubaldi@comcast.net
Website	http://gecorganics.com/
Contact person	Mr. Peter Ubaldi
Title	CEO
Salutation	Mr.
Last name	Ubaldi
Middle name	n/a
First name	Peter
Department	
Mobile	
Direct fax	
Direct tel.	
Personal e-mail	