CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-PDD)
Version 03 - in effect as of: 28 July 2006

CONTENTS

Annexes

SECTION A. General description of project activity

A.1 Title of the project activity:

Montalban Landfill Methane Recovery and Power Generation Project
Version Number 01
14/08/2007

A.2. Description of the project activity:

The Montalban Sanitary Landfill Methane Recovery and Power Generation CDM Project ("Project Activity") will be undertaken in the Montalban landfill in the municipality of Rodriguez, province of Rizal, Philippines. Rodriguez is approximately 50 kilometers northeast of Metro Manila. The Project Activity is based on an area 14 hectares in size, which receives approximately 3,000 tonnes of solid waste per day and has been in operation from January 2002.

The objective of the Project Activity is to collect methane ("CH_4") in landfill gas ("LFG") to generate clean electricity, by installing an onsite LFG collection system, power generation system and flaring system. By capturing the LFG, greenhouse gas ("GhG") emissions are reduced, local environmental impacts are mitigated, and the operational safety of the site is increased.

The Project Activity has been conceived to improve the environment, respond to the need for clean energy, and contribute towards local and national sustainable development through economic and environmental contributions.

In its present state, this extensive landfill area:

- Has cells of between 80-100 metres in depth from ground level
- The landfill is actively managed
- The only surface area of waste exposed is that which is actively receiving waste that day
- Surface areas are covered with dirt to prevent waste from moving and to discourage waste picking
- There is no authorised waste picking at the landfill site; however waste pickers are active on the site

Implementation of the Project Activity will have the following impact:

- **Greenhouse gas emission reduction**: The Global Warming Potential of methane, the main component of LFG, is 21 times that of carbon dioxide ("CO2"). By destroying the methane gas the Project Activity has a positive impact on reducing climate change.

- **Landfill site safety**: Where methane concentrations increase on the landfill site there is a significant risk of explosions. By installing a state-of-the-art collection system to remove the harmful gas will reduce the risk of future explosions.

- **Energy generation**: Methane is a clean fuel. The recovery of LFG and generation of power will contribute to the sustainable development of the Rodriguez Municipality.

- **Job creation**: The Project Activity will be designed, constructed and operated using local resources and supported by international experts. Employment will be created both during construction and whilst the project is operational.

- **Demonstration**: The Project Activity will be one of the first CDM landfill projects in the Philippines, thus building significant experience in the country for LFG technology.

- **Education**: An education centre will be constructed to provide information about the Clean Development Mechanism, LFG to Energy ("LFGTE") projects, clean energy technologies and the Project Activity

This Project Activity assumes that a LFGTE module installed is expected to initially total 15 MW.

Finally, the Project Activity will develop and implement a social programme that addresses the needs of the local waste picking community that will be affected by the landfill remediation. All social projects will be funded by a percentage of the proceeds generated by the sale of Certified Emission Reductions ("CERs").

A.3. Project participants:

Names of Party Involved	Private and/or public project participants	Does the Party involved wish to be considered as project participant
Philippines	Montalban Methane Project Corporation (MMPC)	No
UK	Carbon Capital Markets Ltd	No

A.4. Technical description of the project activity:

A.4.1. Location of the project activity:

The landfill is located in the municipality of Rodriguez, province of Rizal, Philippines.

A.4.1.1. Host Party(ies):

Philippines (the "Host Country")

A.4.1.2. Region/State/Province etc.:

Rizal

A.4.1.3. City/Town/Community etc:

Rodriguez

A.4.1.4. Detail of physical location, including information allowing the unique identification of this project activity (maximum one page):

The Montalban landfill is a solid, non-hazardous waste deposal facility located in Rizal. The Project Activity will be located within the Montalban Solid Waste Disposal Facility, an existing government approved sanitary landfill.

The landfill site is located at the following coordinates: 14 45'58.31"N, 121 7'56.67"E. There are no publicly available aerial photographs of the landfill. The following images provide a view of the landfill site.

A.4.2. Category(ies) of project activity:

Sectoral scope 13: Waste handling and disposal.
Sectoral scope 1: Energy industries (renewable/non-renewable sources)

A.4.3. Technology to be employed by the project activity:

The Project Activity involves the installation of an active gas collection system, an efficient gas flaring plant, collection of leachates and improvement of the landfill covering system, and power generation.

- **Landfill covering**: In order to effectively trap and collect LFG the landfill surface will be covered with a layer of compacted soil.

- **Gas collection system**: The Project Activity will employ a modern landfill gas collection system, consisting of branch pipes, head pipes and extraction wells for effective collection of LFG.

- **Gas pre-treatment system**: Methane gas will be controlled through a series of compressors and a storage tanks prior to actual utilisation in electricity generation.

- **Electricity generation and grid connection system**: Gas engines will be installed with an initial capacity of 15 MW. Electric transformers will be installed to convert the generated power to the correct voltage and amperage.

- **Flaring system**: LFG not utilised for electricity generation will be destroyed in the flaring system associated with the power generators.

- **Monitoring and protection system**: The Project Activity will install onsite monitoring facilities and protection facilities for onsite technology (e.g., such as electricity generators and flares). Monitoring procedures will be international best practice and in accordance with ACM0001 and AMS I.D.

- **Data recording and archiving system**: The system will be designed in accordance with the requirements of ACM0001 and AMS I.D monitoring methodologies.

The technology employed will be state of the art, meeting the highest international standards and best practices. Accordingly, all staff will be suitably trained to operate, maintain and monitor all equipment. Technology will be procured from the following regions and meet the following standards:

Component	Imported or locally manufactured	Standard
Wells	Locally manufactured	According to EU Standards
Gas collection system	Partly Locally manufactured and partly imported.	According to US or EU Standards (operational safety and environmental aspects)
Flaring system	Imported from EU or US	According to EU Standards
Gas engine and generator sets	Imported from EU or US	According to EU Standards
Monitoring and control systems	Imported from EU or US	According to EU Standards

A.4.4 Estimated amount of emission reductions over the chosen crediting period:

By direct flaring of the LFG generated at the site and displacement of grid electricity, the Project Activity is expected to generate 5,822,686 tonnes of emission reductions expressed as tonnes of CO_2e over the 10-year crediting period.

The table below indicates the annual expected amount of emission reductions generated over the entire project lifespan.

Year	CERS
2007	17,084
2008	393,599
2009	447,547
2010	498,022
2011	545,405
2012	590,039
2013	632,235
2014	672,272
2015	710,405
2016	746,861
2017	569,217
Crediting period (in years)	10
Annual Average of Emission reductions (CO_2e tons)	582,269

A.4.5. Public funding of the project activity:

The Project Activity will not receive any public funding.

SECTION B. Application of a baseline and monitoring methodology

B.1. Title and reference of the approved baseline and monitoring methodology applied to the project activity:

The baseline and monitoring methodology to be applied for the proposed project activity is the approved consolidated baseline methodology ACM0001, version 6: ***"Consolidated baseline methodology for landfill gas project activities"*** and ***"Consolidated monitoring methodology for landfill gas project activities"***. For emissions reductions associated with electricity generation using LFG, this PDD also incorporates the small-scale CDM methodology AMS I.D Version 12 ***"Grid connected renewable electricity generation"***.

The additionality of the project activity is demonstrated according to the following methodology: Tool for the demonstration and assessment of additionality – Version 3 ("*Additionality Tool*").

B.2 Justification of the choice of the methodology and why it is applicable to the project activity:

The consolidated methodology ACM0001 is applicable to landfill gas project activities where the baseline scenario is the partial or total atmospheric release of LFG.

In the case of the Project Activity, the baseline scenario is the total atmospheric release of the gas, and the Project Activity is the flaring/destruction of captured gas; ACM0001 is, therefore, applicable to the Project Activity.

With respect to the electricity generation component, emission reductions associated with the LFGTE unit (with an initial nameplate capacity of up to 15 MW) will be determined according to the latest version of AMS-1.D "Grid connected renewable electricity generation" of the simplified modalities and procedures for small-scale CDM project activities. In this case, the Project Activity would not be financially viable without CER revenues, since the financial return from LFG would be insufficient to recover project investments and operational costs.

B.3. Description of the sources and gases included in the project boundary

	Source	Greenhouse Gas	Included/ Excluded	Justification
Baseline	Landfill waste gas	CO_2	Excluded	Not an emissions source
		CH_4	Included	Main emissions source
		N_2O	Excluded	Not an emissions source
Project Activity	Combustion of LFG in flares	CO_2	Excluded	Not an emissions source
		CH_4	Included	Main emissions reduction source
		N_2O	Excluded	Not an emissions source
	Combustion of LFG in generators	CO_2	Excluded	Not an emissions source
		CH_4	Included	Main emissions reduction source
		N_2O	Excluded	Not an emissions source
	Fossil Fuel use[1]	CO_2	Included	Secondary emissions source
		CH_4	Included	Secondary emissions source
		N_2O	Included	Secondary emissions source
	Grid electricity imported / exported	CO_2	Included	Main emissions source
		CH_4	Excluded	Not an emissions source
		N2O	Excluded	Not an emissions source

[1] In the rare event that there is no power grid transmission into the site, a stand-alone diesel engine may be used on-site.

The following diagram below illustrates the various emission sources in the project boundary. The parameters are defined in Section B.7.1.

To be added.

B.4. Description of how the baseline scenario is identified and description of the identified baseline scenario:

According to methodology ACM0001, the baseline is the atmospheric release of the gas and the baseline methodology considers that "*some of the methane generated by the landfill may be captured and destroyed to comply with regulations or contractual requirements, or to address safety and odour concern".*

In the case of the Project Activity, the baseline scenario is the continued uncontrolled release of LFG to the atmosphere, which is what occurs at landfill sites throughout the Host Country.

The baseline scenario is set and additionality is demonstrated according to the following methodology: Tool for the demonstration and assessment of additionality – Version 3 ("*Additionality Tool*").

Details concerning determination of the baseline scenario are described in the examination of additionality in section B.5. Accordingly, the following paragraphs give an outline description.

Step 1 Identification of alternatives to the project activity consistent with current laws and regulations

The following scenarios are examined:

- **Scenario 1**: Maintain the status quo. This scenario assumes that LFG is emitted into the atmosphere without conducting any management, collection or utilization on the landfill site and a Gas Engine Generator ("GEG") is not established.
- **Scenario 2**: LFG recovery project. This scenario assumes that LFG from the landfill site is recovered and combusted by flaring.
- **Scenario 3**: LFG recovery and electricity generation project. This scenario assumes that LFG from the landfill site is recovered and used to generate electricity. This scenario represents the project activity.
- **Scenario 4**: Heat generated from LFG destruction. This scenario assumes that the LFG can used to generate heat which would be sold for the purpose of generating revenue.

Step 2 Investment Analysis
As a result of conducting investment analysis, it became clear that Scenario 1 is the only plausible baseline, as the other possible scenarios do not constitute economically attractive courses of action.

B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity (assessment and demonstration of additionality): >>

The Project Activity represents one of the first of its kind in this country. The regulations pertaining to LFG in the Philippines can be summarised as follows:

- **Ecological Solid Waste Management Act (RA 9003)**: This act came into law in 2002 and makes provisions for a national, integrated, environmentally-friendly framework for solid waste management. It also provides for institutional mechanisms and waste management targets for the local government, including penalties for non-compliance. The act requires that:

  '*Gas control and recovery system – a series of vertical wells or horizontal trenches containing permeable materials and perforated piping placed in the landfill to collect gas for treatment or productive use as an energy source*'.[2] To date this is not complied with since there are no sanitary landfills in the Philippines, with the exception of the Montalban site.

- **Philippine Clean Air Act (RA 8749)**[3]: Local government units are affected by the Philippine Clean Air Act which took effect in 1999 to prohibit vehiclar and industrial sources from emitting pollutants in amounts that cause significant deterioration of air quality. The six Kyoto-regulated GHGs not regulated by the Act. Consequently, the Project Activity is destroying pollutants that are not currently regulated in the Philippines.

Generally, the existing regulations pertaining to the Ecological Solid Waste Management Act and the Philippine Clean Air Act are not complied with and remain un-enforced. A host of articles have been published in the Philippines regarding non-compliance with environmental laws. A recent article state 'our books overflow with environmental laws languishing in the sickbed of non-compliance'[4]. Indeed, non-compliance with the Ecological Solid Waste Management Act is so widespread that the Philippine Bar Association is presently suing at least three Metro Manila Mayors with for their 'alleged' non-compliance with the Act[5].

It can be assumed that no GhG emissions would have been reduced in the absence of the proposed Project Activity.

[2] http://www.elac.org.ph/envilawtoolkit/pollution/ra9003.pdf

[3] http://www.tanggol.org/environmental_laws/cleanair.html

[4] 'Seeing Green' Doris, Gaskell Nuyda, Philippine Daily Inquirer, November 7 2003

[5] 'Mayors Respond to Garbage Raps' Gerry Botril, Philippine Star, May 12, 2005

The additionality tool is fully applied as follows:

Step	Title	Description
Step 0	Preliminary screening based on the starting date of the project activity	Since the project is not scheduled to start before December 31st 2005, this step can be skipped.
Step 1	**Identification of alternatives to the project activity consistent with current laws and regulations**	
Sub-step 1a	Define alternatives to the project activity	**Scenario 1: Maintain the status quo (current business as usual practice)** i.e. waste covering and passive LFG venting with no implementation of gas collecting systems. **Scenario 2: LFG recovery and flaring project**. This alternative represents one potential CDM project activity, but would not be commercially viable except for the use of CER revenues to justify the investment cost. **Scenario 3: LFG recovery and electricity generation project**. This scenario assumes that LFG from the landfill site is recovered and used to generate electricity. This alternative represents the Project Activity. **Scenario 4: Heat generated from LFG destruction**. This scenario assumes that the LFG can used to generate heat which would be sold for the purpose of generating revenue. This scenario is not a commercially viable option even with CER revenues since the heat would not be deliverable to consumers. The identified baseline fuel is represented by the power grid of Luzon as described in the monitoring section of this document, based on data supplied on Philippines Power Statistics for the region of Luzon (calculation supplied separately to the DOE). Given the lack of availability of alternative electricity sources the Luzon grid is the only reliable, stable supplier of the region's electricity.
Sub-step 1b	Consistency with mandatory laws and regulations	Scenario 1, Scenario 2, Scenario 3 and Scenario 4 do not contravene any laws or regulations of the Philippines (see Section B.5). The tool for the demonstration and assessment of additionality states that only laws that are enforced should be considered in the determination of the baseline scenario. Presently, common practice shows that existing landfills in the country do not capture and flare or utilise their landfill gas for health and safety, power generation, or heat production purposes. Those landfill sites that are proposing LFG capture and destruction projects are doing so for the purpose of gaining CDM registration.

Step	Title	Description
Step 2	Investment Analysis	According to the tool for the demonstration and assessment of additionality, one of three options must be applied for this step: (1) simple cost analysis (where no benefits other than CDM income exist for the project); (2) investment comparison analysis (where comparable alternatives to the project exist); or (3) benchmark analysis.
Sub-step 2a	Determine appropriate analysis method	Scenario 1, the status quo, does not have cost and revenue. Scenario 4, does not represent a credible alternative scenario since the location of the landfill site and its distance from the local communities cannot justify it the construction of heat transport pipelines. Whilst the Philippines generates substantial amounts of geothermal power (via steam) the thermal energy is converted into electricity and transported via the country's grid network. Given the lack of infrastructure, experience and technology it is highly unlikely that such a project would be commissioned and approved by the Philippines. Finally, a Heat Purchase Agreement ("HPA") could be secured to justify the substantial investment costs associated with the project's implementation. According to the methodology for determination of additionality, if the alternative scenarios to the Project Activity do not include investment of comparable scale to the Project Activity, then Option III of the tool must be used. As this is the case for the proposed Project Activity, Option III is applied.
Sub-step 2b: for Scenario 3	Option III. Apply benchmark analysis	In the case of Scenario 3, which represents the Project Activity, securing revenues from electricity generation would increase the IRR of the project activity, though not to an IRR high enough to warrant the investment. The likelihood of development of this project, as opposed to the continuation of current activities (i.e., no collection and combustion of landfill gas for purposes other than CER generation), will be determined by examining its IRR in Sub-step 2c (below).
Sub-step 2c: for Scenario 3	Calculation and comparison of financial indicators	The table below shows the financial analysis for Scenario 3. **Table:** Financial results of the Scenario 3 in case of the Electrical Generation and without carbon finance. NPV uses 10% discount rate which is in line with commercial expectations. The electricity price is assumed to be 0.135 USD /KWh which is consistent with average prices in the Philippines. **Without Carbon Revenues** Net Present Value (USD) 5,185,449 IRR (%) 14% Discount Rate (%) 10%
Sub-step	Sensitivity	A sensitivity analysis may be conducted by altering those parameters which were most likely to fluctuate over time:

Step	Title	Description
2d: for Option 3	analysis	▪ Increase in project revenue (increase in price of electricity sold to the grid) ▪ Reduction in project capital on running costs. **Scenario** / **% Change** / **IRR (%)** / **NPV (USD)** Original / 0 / 14% / 5,185,449 Increase in Project Revenue / 10 / 19% / 12,543,921 Reduction in project costs / 10 / 16% / 7,114,378 Sensitivity analysis shows that the project does not have viable returns even when the revenue from power increases or the project costs decrease. Consequently, Scenario 3 cannot be considered as financially attractive.
Step 3	Barrier Analysis	Step 3 can be skipped since Step 2 indicates that Scenario 3 is not financially attractive.
Step 4	Common Practice Analysis	*Applicable to Scenario 1, Scenario 2 and Scenario 3*
Sub-step 4a	Analyze other activities similar to the proposed project activity	There are two other landfill projects in Philippines currently seeking CDM registration; all other landfills are considered open or unmanaged dumps. The Project Activity will be one of the first projects of its kind in the country whereby landfill gas is captured and destroyed specifically to generate clean power.
Sub-step 4b	Discuss any other similar options that are occurring	As described above, there are two landfills seeking CDM registration in the Philippines; all other landfills in the Philippines are considered open or unmanaged dumps. According to the report of the National Solid Waste Management Commission, there are still about 734 open dumpsites existing nationwide[6].
Conclusion		In accordance with the *Additionality Tool*, sub-step 4a and 4b are satisfied; that is, similar activities cannot be observed, then the Scenario 3, Project Activity, is additional because:

[6] 'Ecological Solid Waste Management Act of 2000 (RA 9003): A Major Step to Better Solid Waste Management in the Philippines' Sapuay, G., Development of Soild Waste Act, 2006

Step	Title	Description
		Finally, the methodology is applicable because: • the most plausible baseline scenario for the LFG is the atmospheric release of LFG; and • without the Project Activity electricity is obtained from the existing grid.

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

Step 1

The GhG emissions reduction achieved by the Project Activity:

$$ER_y = (MD_{project,\,y} - MD_{reg})*GWP_{CH4} + EL_y*CEF_{electricity,\,BL,y} - ET_y * CEF_{elec,\,PR,y} + ET_{PR} * CEF_{elec,\,PR,y} + ET_{LFG} \quad (1)$$

ER_y	GhG emissions reduction (in year y), in tonnes of CO_2 equivalents (tCO_2) as a result of project implementation
$MD_{project,\,y}$	The amount of methane that would have been destroyed/combusted during the year, in, tonnes of methane (tCH_4)
$MD_{reg,\,y}$	The amount of methane that would have been destroyed/combusted during the year in absence of the project, in, tonnes of methane (tCH_4)
GWP_{CH4}	Global Warming Potential value for methane for the first commitment period is 21 tCO_2e/CH_4
$EL_{LFG,y}$	Net quantity of electricity produced using LFG, exportedwhich in the absence of the project activity would have been produced by power plants connected to the grid or by an on-site/off-site fossil fuel based captive power generation, during year y, in megawatt hours (MWh).
$CEF_{elecy,\,BLy}$	CO2 emissions intensity of the baseline source of electricity displaced, in tCO2e/MWh. This is estimated as per equation (6) below.
$ET_{LFG,\,y}$	The quantity of thermal energy produced utilizing the landfill gas, which in the absence of the project activity would have been produced from onsite/offsite fossil fuel fired boiler, during the year y in TJ.
$CEF_{ther,BL,y}$	CO2 emissions intensity of the fuel used by boiler to generate thermal energy which is displaced by LFG based thermal energy generation, in tCO2e/TJ. This is estimated as per equation (7) below.
$EL_{PR,y}$	Is the amount of electricity generated in an on-site fossil fuel fired power plant or imported from the grid as a result of the project activity, measured using an electricity meter (MWh)
$CEF_{elect,PR,y}$	Is the carbon emissions factor for electricity generation in the project activity (tCO2/MWh). This is estimated as per equation (8) below

According to ACM0001, no leakage is expected for such project activities.

Step 2

The amount of methane that would have been destroyed/consumed in the absence of the Project Activity is as:

$$MD_{reg} = MD_{project,y} * AF \quad (2)$$

The Adjustment factor ("AF") is defined as the ratio of the destruction efficiency of the collection and destruction system mandated by regulatory or contractual requirements to that of the collection and

destruction system in the Project Activity. For this project, there are no regulatory or contractual requirements and the baseline scenario chosen above is that all landfill gas would be released into the atmosphere. Therefore, the AF applied to the Project Activity is 0 and MD_{reg} is = 0.

Step 3

The Project Activity does not include thermal energy generation from LFG, then the amount of methane that would have been destroyed / combusted during the year will be the addition of the following terms:

$$MD_{project,y} = MD_{flared,y} + MD_{electricity,y} \quad (3)$$

Both components of this equation are expressed separately in Step 4 and Step 7.

Step 4

$MD_{flared,y}$ is the quantity of methane destroyed by flaring by the Project Activity. It is calculated as follows:

$$MD_{flared,y} = (LFG_{flared,y} * W_{CH4y} * D_{CH4}) - (PE_{flare,y} / GWP_{CH4}) \quad (4)$$

$LFG_{flare,y}$	The quantity of landfill gas fed to the flare during the year measured in cubic meters (m^3)
W_{CH4}	The average methane fraction of the landfill gas as measured* during the year and expressed as a fraction (in m^3 CH_4 / m^3 LFG)
D_{CH4}	The methane density expressed in tonnes of methane per cubic meter of methane (tCH_4/m^3CH_4)**
$PE_{flare,y}$	The project emissions from flaring of the residual gas stream in the year y (tCO_2)

(*) Methane fraction of the landfill gas to be measured on wet basis
(**) At standard temperature and pressure (101.325 kPa and 273.15 K) the density of methane is 0.0007168 tCH_4/m^3CH_4)

The Project Emissions (PE) will be determined following the procedure described in the "*Tool to determine project emissions from flaring gases containing Methane"* as shown in step 5.

Step 5

$MD_{electricity}$ represents the quantity of methane destroyed for the generation of electricity in the Project Activity and is expressed by the following equation:

$$MD_{electricity,\,y} = LFG_{electricity,\,y} * W_{CH4y} * D_{CH4} \quad (7)$$

$LFG_{electricity\ y}$	Quantity of landfill gas used to generate electricity during a year measured in cubic meters (m^3)
W_{CH4y}	Average methane fraction of the LFG as measured during the year and expressed as a fraction (m^3 CH_4/m^3 LFG)
D_{CH4}	Density of methane expressed in tonnes of methane (tCH_4/m^3 LFG)

Step 6

CO2 emissions intensity of the baseline electricity source:

(5)

$$CEF_{elec,BL,y} = \frac{EF_{fuel,BL}}{\sum_{gen,BL}. NCV_{fuel,BL}} * 3.6$$

Baseline electricity is generated by plants connected to the grid, as per AMS.I.D version 12. The calculation has been provided separately to the DOE.

Step 7

The tool offers two options for enclosed flares. This Project Activity will use the 90% default efficiency factor with continuous monitoring of manufacturer's specifications (temperature and flow rate of residual gas at the inlet of the flare). If in any specific hour, any parameter is out of the limit of manufacturer's specifications, an efficiency of 50% will be used.

Step 8

CO2 emissions intensity of the grid electricity purchased:

(6)

$$CEF_{elec,BL,y} = \frac{EF_{fuel,BL}}{\sum_{gen,BL}. NCV_{fuel,BL}} * 3.6$$

Baseline electricity is generated by plants connected to the grid, as per AMS.I.D version 12. The calculation has been provided separately to the DOE.

B.6.2. Data and parameters that are available at validation:

Data / Parameter:	GWP CH_4
Data unit:	tonne CO_2e/tonne of CH_4
Description:	Global Warming Factor ("GWP") value for CH_4
Source of data used:	IPCC

Value applied:	21
Justification of the choice of data or description of measurement methods and procedures actually applied :	The IPCC approved is GWP is 21 tonnes of CO_2e/tonne of CH_4
Any comment:	

Data / Parameter:	AF
Data unit:	-
Description:	Adjustment Factor
Source of data used:	-
Value applied:	0.00
Justification of the choice of data or description of measurement methods and procedures actually applied :	
Any comment:	Changes in the law shall be monitored as a matter of procedure

Data / Parameter:	$CEF_{electricity}$
Data unit:	Tonnes of CO_2e/MWh
Description:	CO_2e emissions conversion factor for electricity
Source of data used:	Power Statistics for the Region of Luzon from the Department of Energy of Philippines
Value applied:	0.6138
Justification of the choice of data or description of measurement methods and procedures actually applied :	The emission factor was developed based on official emission and generation data of all the generating units in Luzon, the region where Montalban is, in 2006.
Any comment:	This figure will be updated from year to year as data is made available

Data / Parameter:	η_{flare}
Data unit:	--
Description:	Efficiency of the flare combustion
Source of data used:	Default value from "Tool to Determine Project Emissions from Flaring Gases Containing Methane"
Value applied:	90%
Justification of the choice of data or description of measurement methods	A default value for closed flares can be used under this Tool when substantiated with continuous measurements of the manufacturer's specifications (temperature and flow rate of residual gas at flare inlet). In any hour where these parameters fall out of specification, an efficiency value of 50% will be used

and procedures actually applied :	
Any comment:	

Data / Parameter:	D_{CH4}
Data unit:	tCH_4/m^3 CH_4
Description:	Methane Density
Source of data used:	Conversion factor provided by Revision to the approved consolidated baseline methodology ACM0001 (Version 5)
Value applied:	0.0007168
Justification of the choice of data or description of measurement methods and procedures actually applied :	Since the value adopted in the approved consolidated methodology is used, the selected data are considered to be appropriate.
Any comment:	Changes in the approved methodology shall be checked for in monitoring.

Data / Parameter:	$CEF_{thermal}$
Data unit:	tCO_2e/TJ of fossil fuel
Description:	CO_2 emissions intensity of the fuel used to generate thermal / mechanical energy, in tCO_2e/TJ
Source of data used:	IPCC 1996 Revised Guidelines and WRI's GHG Protocol Guidelines
Value applied:	69.57 tCO_2e/TJ of diesel
Justification of the choice of data or description of measurement methods and procedures actually applied :	Data from recognized and commonly used sources are used and the emission factor for diesel varies in a very small range from country to country and the emissions from this source are immaterial relative to the total emission reductions.
Any comment:	

B.6.3 Ex-ante calculation of emission reductions:

US EPA Decay Model Used to Estimate Emission Reductions

First-Order Decomposition Rate Equation:

$$Q_{CH_4} = \sum_{i=1}^{n} \sum_{j=0.1}^{1} kL_o \left(\frac{M_i}{10} \right) e^{-kt_{ij}}$$

Where:

Q_{CH4} = annual methane generation in the year of the calculation (m^3/year)

i = 1-year time increment

n = (year of the calculation) - (initial year of waste acceptance)

j = 0.1-year time increment

k = methane generation rate ($year^{-1}$)

L_o = potential methane generation capacity (m^3/Mg)

M_i = mass of waste accepted in the i^{th} year (Mg)

t_{ij} = age of the j^{th} section of waste mass M_i accepted in the i^{th} year

The quantity of waste was based on data provided by the Ministry. Results are summarized below.

B.6.4 Summary of the ex-ante estimation of emission reductions:

The ex-ante estimation of baseline emissions are calculated based on the methodology in section B.6.3. Project emissions will be from landfill gas collection efficiency, flare combustion efficiency and use of a stationary combustion diesel engine for on-site power.

The ex-ante estimation of emission reductions shown below are, therefore, the baseline emissions discounted by using a 50% collection efficiency and a 90% flare efficiency. The project emissions from the use of diesel are expected to be minor compared to the combusted landfill gas. These will be accounted for once the LFG collection system has been designed (e.g., power for the blowers, etc).

The ex-ante estimation of emission reductions as a consequence of the Project Activity is shown in the table below. Once the Project Activity is operating, these emissions reductions will be obtained through the measurement of actual parameters, in accordance with ACM0001 methodology version 5 and AMS I.D Version 10.

Year	CERS
2007	17,084
2008	393,599
2009	447,547
2010	498,022
2011	545,405
2012	590,039
2013	632,235
2014	672,272
2015	710,405
2016	746,861
2017	569,217

Crediting period (in years)	10
Annual Average of Emission reductions (CO_2e tons)	582,269

* * Crediting period is anticipated to start in October 1st of 2007 and end in September 30th of 2017.

B.7 Application of the monitoring methodology and description of the monitoring plan:

B.7.1 Data and parameters monitored:

Note: whilst only the parameters monitored are listed below, each parameter has retained its original ID Number to remain in line with ACM0001.

Data / Parameter:	**$LFG_{total,y}$**
Data unit:	m^3
Description:	Total amount of landfill gas captured
Source of data to be used:	On-line LFG Flow meter
Value of data applied for the purpose of calculating expected emission reductions in section B.5	see section B.6.3
Description of measurement methods and procedures to be applied:	Measured continuously and recorded once a hour Data archive: electronic Length of archiving: during the crediting period plus two years post crediting period.
QA/QC procedures to be applied:	Calibration of equipment as per manufacturer specifications to ensure validity of data measured. Low Uncertainly level of data
Any comment:	Monitoring ID Number 1

Data / Parameter:	**$LFG_{flare,y}$**
Data unit:	m^3
Description:	Amount of landfill gas flared
Source of data to be used:	On-line LFG flow meter for each flare
Value of data applied for the purpose of calculating expected emission reductions in section B.5	see section B.6.3

Description of measurement methods and procedures to be applied:	Measured continuously and recorded once a hour Data archive: electronic Length of archiving: during the crediting period plus two years post crediting period.
QA/QC procedures to be applied:	Calibration of equipment as per manufacturer specifications to ensure validity of data measured. Low Uncertainly level of data
Any comment:	Monitoring ID Number 2

Data / Parameter:	**$LFG_{electricity,y}$**
Data unit:	m^3
Description:	Amount of landfill gas combusted in power plant
Source of data to be used:	On-line LFG Flow meter for each power plant
Value of data applied for the purpose of calculating expected emission reductions in section B.5	-
Description of measurement methods and procedures to be applied:	Measured continuously and recorded once a month Data archive: electronic Length of archiving: during the crediting period plus two years post crediting period.
QA/QC procedures to be applied:	Calibration of equipment as per manufacturer specifications to ensure validity of data measured. Low uncertainly level of data
Any comment:	Monitoring ID Number 3

Data / Parameter:	**$PE_{flare, y}$**
Data unit:	tCO_2e
Description:	Project emissions from flaring of the residual gas stream, determined according to Annex 13 "Tool to determine project emissions from flaring gases containing methane"
Source of data to be used:	i) Flow meter in the residual gas conducts a. Volumetric flow rate of the residual gas in dry basis at normal conditions in the hour h ii) Thermocouple Type N a. Measure the temperature of the exhaust gas stream in the flare ("TEX") (K)
Value of data applied for the purpose of calculating expected emission reductions in section B.5	$\eta_{flare} = 90\%$
Description of	Continuous monitoring of the methane destruction efficiency of the flare

measurement methods and procedures to be applied:	measured hourly. Data archive: electronic Length of archiving: during the crediting period plus two years post crediting period
QA/QC procedures to be applied:	Calibration of equipment as per manufacturer specifications to ensure validity of data measured. The thermocouples will be replaced or calibrated every year. Medium Uncertainly level of data
Any comment:	If the temperature of the exhaust gas of the flare (T_{flare}) is below 500ºC during the hour h the flare efficiency value will be $\eta_{flare,h} = 0\%$ If the parameters fall outside manufacturer's specifications for any specific hour, a default of $\eta_{flare,h} = 50\%$. Manufacturer's specifications are detailed in Annex 3. Monitoring ID Number 5

Data / Parameter:	**$W_{CH4,y}$**
Data unit:	m^3 CH_4/m^3 LFG
Description:	Methane fraction in the landfill gas
Source of data to be used:	On-line LFG analyzer
Value of data applied for the purpose of calculating expected emission reductions in section B.5	50%
Description of measurement methods and procedures to be applied:	Measured continuously and recorded once a hour Data archive: Electronic Length of archiving: during the crediting period plus two years post crediting period.
QA/QC procedures to be applied:	Calibration of equipment as per manufacturer specifications to ensure validity of data measured. Low Uncertainly level of data
Any comment:	Monitoring ID Number 6

Data / Parameter:	**T**
Data unit:	ºC / K
Description:	Temperature of the landfill gas
Source of data to be used:	Thermometer Measured On line
Value of data applied for the purpose of calculating expected emission reductions in section B.5	For ex-ante estimation of emission reductions, the pressure of landfill gas is not required for the Landgem model that was used. This parameter is needed and will be used for monitoring during the project period.

Description of measurement methods and procedures to be applied:	Measured continuously and recorded once a hour Data archive: electronic Length of archiving: during the crediting period plus two years post crediting period.
QA/QC procedures to be applied:	Calibration of equipment as per manufacturer specifications to ensure validity of data measured.
Any comment:	Monitoring ID Number 7 Note that the Esters flow meter will have an integrated pressure and temperature measurement to deliver the normalized m³/h

Data / Parameter:	**P**
Data unit:	Pa
Description:	Pressure of the landfill gas
Source of data to be used:	Pressure gauge Measured On line
Value of data applied for the purpose of calculating expected emission reductions in section B.5	- For ex-ante estimation of emission reductions, the pressure of landfill gas is not required for the Landgem model that was used. This parameter is needed and will be used for monitoring during the project period.
Description of measurement methods and procedures to be applied:	Measured continuously and recorded once a hour Data archive: electronic Length of archiving: during the crediting period plus two years post crediting period.
QA/QC procedures to be applied:	Calibration of equipment as per manufacturer specifications to ensure validity of data measured.
Any comment:	Monitoring ID Number 8 Note that the Esters flow meter will have an integrated pressure and temperature measurement to deliver the normalized m³/h

Data / Parameter:	**EL_{LFG}**
Data unit:	MWh
Description:	Net amount of electricity generated using LFG
Source of data to be used:	Electricity meter Measured on site
Value of data applied for the purpose of calculating expected emission reductions in section B.5	79,062 MWh
Description of measurement methods and procedures to be	Measured continuously and recorded once a month Data archive: electronic Length of archiving: during the crediting period plus two years post crediting

applied:	period.
QA/QC procedures to be applied:	Calibration of equipment as per manufacturer specifications to ensure validity of data measured.
Any comment:	Monitoring ID Number 9

Data / Parameter:	**EL_{PR}**
Data unit:	Tonne
Description:	Total amount of fossil fuel required to meet project requirements
Source of data to be used:	Electricity meter Measured on site
Value of data applied for the purpose of calculating expected emission reductions in section B.5	0 tonnes
Description of measurement methods and procedures to be applied:	Measured continuously and recorded once a month Data archive: electronic Length of archiving: during the crediting period plus two years post crediting period.
QA/QC procedures to be applied:	Calibration of equipment as per manufacturer specifications to ensure validity of data measured.
Any comment:	Monitoring ID Number 10

Data / Parameter:	**ET_{PR}**
Data unit:	Tonne
Description:	Total amount of fossil fuel required to meet project requirement
Source of data to be used:	Electronic
Value of data applied for the purpose of calculating expected emission reductions in section B.5	Measured on site
Description of measurement methods and procedures to be applied:	Data archive: electronic Length of archiving: during the crediting period plus two years post crediting period.
QA/QC procedures to be applied:	Metering
Any comment:	Monitoring ID Number 12

Data / Parameter:	**$CEF_{elecy,BL}$**
Data unit:	tCO_2/MWh

Description:	CO_2 emission intensity of the electricity and/or other energy carriers in the previous parameter.
Source of data to be used:	Philippines Department of Energy (DOE) – Philippines Power Statistics for the region of Luzon
Value of data applied for the purpose of calculating expected emission reductions in section B.5	0.614
Description of measurement methods and procedures to be applied:	Data archive: electronic Length of archiving: during the crediting period plus two years post crediting period.
QA/QC procedures to be applied:	Annual review of the power statistics published by the Philippines DOE
Any comment:	Monitoring ID Number 13

Data / Parameter:	**$CEF_{elecy,y,PR,y}$**
Data unit:	tCO_2/MWh
Description:	CO_2 emission intensity of the electricity and/or other energy carriers in the previous parameter.
Source of data to be used:	Philippines Department of Energy (DOE) – Philippines Power Statistics for the region of Luzon
Value of data applied for the purpose of calculating expected emission reductions in section B.5	0
Description of measurement methods and procedures to be applied:	Data archive: electronic Length of archiving: during the crediting period plus two years post crediting period.
QA/QC procedures to be applied:	Annual review of the power statistics published by the Philippines DOE
Any comment:	Monitoring ID Number 19

Data / Parameter:	**$EF_{fuel,PR}$**
Data unit:	CO_2 emissions factor of fossil fuel
Description:	tCO2/Mass or volume
Source of data to be used:	Methodology AMS 1.D - Table 1.D.1 - Emission Factor for Diesel Generator System (using an emission factor of 3.2 kg CO2 per kg of diesel from revised 1996 IPCC Guidelines). Calculations have been provided to the DOE for review.
Value of data applied for the purpose of	69.57 t CO_2e/TJ of diesel (converted from 3.2 kg CO2 per kg diesel)

calculating expected emission reductions in section B.5	
Description of measurement methods and procedures to be applied:	The emission factor is a standard factor that does not change over time.
QA/QC procedures to be applied:	Methodology AMS 1.D - Table 1.D.1 - Emission Factor for Diesel Generator System (using an emission factor of 3.2 kg CO2 per kg of diesel from revised 1996 IPCC Guidelines). Calculations have been provided to the DOE for review.
Any comment:	Monitoring ID Number 21

Data / Parameter:	**$NCV_{fuel,PR}$**
Data unit:	Net calorific value of fossil fuel
Description:	GJ/mass of volume
Source of data to be used:	IPCC
Value of data applied for the purpose of calculating expected emission reductions in section B.5	No diesel consumption is expected in the project but the consumption will be monitored if it is used.
Description of measurement methods and procedures to be applied:	Data archive: electronic Purchase record quantities Length of archiving: during the crediting period plus two years post crediting period.
QA/QC procedures to be applied:	The fuel consumption is recorded regularly and correlated with fuel purchase records. All records will be kept for verification.
Any comment:	Monitoring ID Number 22

Data / Parameter:	**ETy**
Data unit:	TJ of fuel
Description:	Thermal energy used in landfill during project
Source of data to be used:	Purchase records for volume of fuel and fuel calorific value
Value of data applied for the purpose of calculating expected emission reductions in section B.5	No diesel consumption is expected in the project but the consumption will be monitored if it is used.
Description of measurement methods and procedures to be applied:	Data archive: electronic Purchase record quantities Length of archiving: during the crediting period plus two years post crediting period.

QA/QC procedures to be applied:	The fuel consumption is recorded regularly and correlated with fuel purchase records. All records will be kept for verification.
Any comment:	Monitoring ID Number 23

Data / Parameter:	**Regulatory requirements relating to landfill gas projects**
Data unit:	--
Description:	Regulatory requirements relating landfill gas projects
Source of data to be used:	National laws, standards, requirements, and communication with the DNA of Philippines.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	No regulations relating to landfill gas projects.
Description of measurement methods and procedures to be applied:	The information will be checked and recorded twice a year.
QA/QC procedures to be applied:	Confirmation with the relevant government departments at the end of each year.
Any comment:	Monitoring ID Number 25

Data / Parameter:	**Operations of the energy plant**
Data unit:	Hours
Description:	Operations of the energy plant
Source of data to be used:	On-site measurement
Value of data applied for the purpose of calculating expected emission reductions in section B.5	8760
Description of measurement methods and procedures to be applied:	On-site measurement of the operating hours of the generators. 100% of all data are measured and archived electronically, recording frequency will be annual.
QA/QC procedures to be applied:	The meter will be calibrated regularly according to manufacturer's regulations.
Any comment:	Monitoring ID Number 26

B.7.2 Description of the monitoring plan:

The monitoring plan will be described in detail in an Operational Manual. It will be the responsibility of the site manager and undertaken by site staff responsible for the maintenance and care of the landfill gas collection system and flaring unit. The monitoring plan covers:

- responsibility of members of the monitoring team;
- routine reminders for site staff;
- QA/QC procedures;
- service forms for data reporting;
- corrective action plans;
- maintenance plans; and
- monitoring schedules.

Measurements will be taken using state-of-the-art technology such as continuous flow meters.

The site manager will ensure the measurements are recorded and calibration/maintenance actions are performed per schedule, review the results of the measurements, ensure proper records are kept and transmit data for archiving.

Carbon Capital Markets Ltd will perform quality assurance on the data and ensure archiving of the data for the specified period (crediting period plus two years). At the time of verification, training materials and information about the timing of completed trainings would be provided to the DOE.

B.8 Date of completion of the application of the baseline study and monitoring methodology and the name of the responsible person(s)/entity(ies)

10/08/2007

Kevin Lok
Carbon Capital Markets Ltd
Carbon Logistics
Level 3, 15 Berkeley Street
London, W1J 8DY
United Kingdom

SECTION C. Duration of the project activity / crediting period

C.1 Duration of the project activity:

C.1.1. Starting date of the project activity:

30/09/2007

C.1.2. Expected operational lifetime of the project activity:

12 years

C.2 Choice of the crediting period and related information:

C.2.1. Renewable crediting period

C.2.1.1. Starting date of the first crediting period:

C.2.1.2. Length of the first crediting period:

C.2.2. Fixed crediting period:

A ten-year fixed crediting period will be used for this project.

C.2.2.1. Starting date:

01/10/2007

C.2.2.2. Length:

10 (ten) years

SECTION D. Environmental impacts

D.1. Documentation on the analysis of the environmental impacts, including transboundary impacts:

The Project Activity was granted an Environmental Compliant Certificate (ECC) on August 25, 2004 by the Local Government of Rodriguex. Additionally, the Project Activity has received a letter of no objection by the Department of Environmental and Natural Resources, the respective DNA office.

The Project Activity will collect and destroy LFG that is currently released to the atmosphere, thereby reducing harmful global and local environmental effects. Apart from contributing to global warming and stratospheric ozone layer depletion, LFG emissions pose serious health and safety problems to the local environment, affecting the neighbouring population and causing damage to crops, plants and to the local fauna.

Despite the numerous positive effects of the Project Activity, the following environmental issues have been considered in the development of the project in consultation with the proposed technology provider:

- Risks from collection, pumping and treatment of LFG (such as risk of fire from installation of flaring equipment) will be properly controlled through various equipment safety precautions (temperature and air intake control equipment, alarms, safety valves, automatic shutdown, etc) that are incorporated into the capture and flaring equipment. As well, a preventative maintenance plan for on-site equipment will be put in place to ensure the equipment continues to work according to manufacturer's specifications. Lastly, personnel working near the equipment will be provided with appropriate training for personal safety as well as proper equipment maintenance and operation.
- Noise and vibration caused by LFG collection equipment will not affect the local populations. Moreover, the equipment will incorporate enclosed acoustic housings for sound reduction as much as possible.
- Air pollution resulting from combustion of LFG, such as SO_2, NO_X, VOC, CO, is possible; however, these emissions are expected to be minimal because the Project Activity includes a high-temperature, high efficiency combustion system congruent with EU standards. The majority of these emissions will be destroyed and the remainder will be minimal and significantly less harmful than the continued uncontrolled release of LFG.

D.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

The Project Activity results in positive environmental impacts. Of the possible environmental issues that have been considered in the development of the project, these are minimized by the use of appropriate technology, procedures and area characteristics.

- To minimise noise pollution that may be generated by the Project Activity acoustic housing will be used where appropriate.
- Safety training and equipment will be provided to the personnel who will be working in close proximity to the flare and capture system.
- Since the landfill site will remain active for a number of years maximum consideration will be made for the safety aspects of this Project Activity. Specifically, preventative measures will be taken to ensure that flares and associated equipment will be secure, tamper proof and separated from local peoples.

According to regulations in Philippines, an Environmental Impact Assessment is not required for the implementation of LFG collection and flaring systems in open dumps and power generation. The Project Activity meets all regulatory requirements at municipal, state and national level in the Host country.

The Project Activity was granted an Environmental Compliant Certificate (ECC) on August 25, 2004 by the Local Government of Rodriguex. Additionally, the Project Activity has received a letter of no objection by the Department of Environmental and Natural Resources, the respective DNA office.

SECTION E. Stakeholders' comments

E.1. Brief description how comments by local stakeholders have been invited and compiled:

The stakeholder consultation was held on 12 July 2007 at the Montalban Landfill facilities in Rodriguez where the Project Activity will take place.

Individual invitations were sent to relevant stakeholders. In addition, the stakeholder consultation information was circulated among the press who attended on the day. Overall more than six articles have been written about the Project Activity, many of which also refer to the Kyoto Protocol and the impacts of the CDM. The articles produced by the media have been provided to the DOE for review.

More than 300 individuals participated in the stakeholder consultation, including representatives of the Municipality, local community member and waste pickers. A full list of participants, an agenda, evidence of the promotion of the stakeholder consultation and the presentation made has been provided to the DOE for review.

Questions on the Project Activity and related social and environmental impacts were received for almost two hours following the presentation.

E.2. Summary of the comments received:

No material comments were received.

E.3. Report on how due account was taken of any comments received:

No negative comments were received. None of the comments received necessitated a change to the PDD approach.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

Organization:	Carbon Capital Markets Ltd
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Organization:	Montalban Methane Power Corp
Street/P.O.Box:	143 Dela Rosa Street., Corner of Adelantado Street
Building:	3/F, BMMC building
City:	Legaspi Village
State/Region:	Makati City
Postfix/ZIP:	
Country:	Philippines
Telephone:	
FAX:	
E-Mail:	
URL:	
Represented by:	Mr. Napoleon M. Opiniano
Title:	AVP-Operations
Salutation:	
Last Name:	
Middle Name:	
First Name:	
Department:	

Mobile:	
Direct FAX:	
Direct tel:	
Personal E-Mail:	nmopiniano@mmpc.com.ph

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

The project will not receive any public funding.

Annex 3

BASELINE INFORMATION

Year	Landfill Gas Generated (m3/year)
2007	80,708,518
2008	94,611,960
2009	107,579,601
2010	119,712,625
2011	131,102,397
2012	141,831,434
2013	151,974,287
2014	161,598,327
2015	170,764,460
2016	179,527,771
2017	187,938,098

1) based on Landgem input assumptions below and methodology in section B.6.3
2) using a GWP of 21
3) assuming a 50% capture efficiency
4) assuming a 90% flare efficiency

Parameters used in Landgem:

k = 0.104
Lo = 92

Annex 4

MONITORING INFORMATION

1) Monitoring Methodologies

The monitoring plan covers procedures for the systematic surveillance of the CDM Project Activity's performance by measuring and recording performance-related indicators relevant to the project in accordance with the Monitoring Methodology ACM0001 and AMS.I.D. The plan provides for continuous measurement of the quantity and quality of LFG captured and destroyed and electricity generated. The specific variables monitored are highlighted below:

To be added.

2) Monitoring indicators

Monitoring indicators are required to meet the Host Country's 'Sustainable Development Benefits Description' ("SDBD") project information form. The SDBD requires that economic, environmental and social indicators are recognised and monitored. Key indicators that the Project Activity will monitor include are:

- **Environmental**: The main pollutants generated as a result of implementation of the project activity are sulphur dioxide and nitrous oxide emissions, odour and condensate, and noise pollution.

- **Social**: The number of jobs created and the improvement of qualifications and attendance of training programmes will be monitored. Additionally, electricity supply to the local grid will be evaluated.

- **Economic**: During the period that the Project Activity is in operation tax revenue, electricity revenue, employee incomes, CER revenues will be indicated.

3) Monitoring management

All monitoring of the CDM aspects of the Project Activity will be organised and managed by the designated CDM Monitoring Manager. The CDM Monitoring Manager will be responsible for the supervision and collection of data, for staff that undertake relevant CDM monitoring activities, for organising training programmes, and for hosting monthly reporting meetings. All monitoring management activities described below will fall under the remit of the CDM Monitoring Manager.

- **Routine Reminders for site staff:** All site staff will be issued with a reminder list to guide them through their daily, weekly and monthly routine. In addition, archived data will be checked to ensure it is being appropriately maintained.

- **Corrective Actions:** There will be quality assurance measures to handle and correct nonconformities in the implementation of the Project or this Monitoring Plan. In case such nonconformities are observed:
    - An analysis of the nonconformity and its causes will be carried out,

- Appropriate corrective actions to eliminate the non-conformity and its causes will be identified, and
- The implementation of corrective actions will be reported.

- **Service Forms:** Service sheets will be used to ensure all aspects of the monitoring are completed and recorded. These sheets will serve as a procedural reminder and record of the monitoring that is required for the CDM project activity.

- **Calibration of measurement equipment:** Calibration of measurement equipment will be defined and scheduled by the technology provider.

- **Operational Manual**: All the information about monitoring procedures and quality assurance measures will be included in an Operational Manual. The Operational Manual will include procedures for training, capacity building, proper handling and maintenance of equipment, emergency plans.

There will be a team that will cover all aspects of the monitoring. The team members will be responsible for collecting, reviewing, recording and archiving the data. There will be a CDM Monitoring Manager who shall perform a quality check of the team's work ensuring that the monitoring is performed correctly and on time. The manager will report monthly to Carbon Capital Markets about project performance and data. He/She will inform Carbon Capital markets immediately in the event of non-conformance and technical problems. The manager will be the one of the main contacts for the verifier, DNA of Philippines, and local authorities, during the crediting period.

A CDM Project Team will be formed for monitoring purposes for the Project Activity and report to the CDM Monitoring Manager. The project team comprises at least one representative of Carbon Capital Markets, the MMPC chief engineer, and the site manager. It will gather at least monthly, face-to-face or by conference call, to discuss the performance of the Project Activity. In case of non-conformance, each member of the team could call for a meeting. All meeting minutes will be recorded.

The monitoring tools that will be available to the team and the CDM Monitoring Manager include:

- Operational Manual (see above) including procedures on what is to be monitored, frequency of the monitoring, equipment to be used, maintenance required on instrumentation, corrective actions, etc.
- This Project Design Document
- UNFCCC baseline and monitoring methodology (ACM0001 and AMS 1.D)
- Service sheets (see above)
- Spreadsheets

The spreadsheets will serve as a registry of the all data collected by the different measuring equipments distributed all over the facilities. They will also be used to quantify CERs achieved by the Project Activity during specific time periods through the use of auxiliary equations.

For the purposes of QA/QC and archiving data will be transmitted electronically to MMPC and Carbon Capital Markets Ltd on a weekly basis as well as a reporting of any anomalies, equipment failures or any other causes of data loss. A final data quality check of the information will be made before an archived copy is created.

4) Verification

The verification procedure of the Project Activity will be carried out by an independent third party on a regular basis. To ensure the swift and accurate completion of the verification process the Project Activity will ensure all documents are correctly managed and archived as per the ACM0001 and AMS I.D monitoring methodologies.