Monitoring report form
(Version 03.2)

Monitoring report

Title of the project activity	Culiacan Northern Landfill Gas Project
Reference number of the project activity	Project 3127
Version number of the monitoring report	Version 1
Completion date of the monitoring report	13/02/2014
Registration date of the project activity	09/07/2010
Monitoring period number and duration of this monitoring period	Third Monitoring Period, from 01/08/2012 to 31/12/2013 (both days included)
Project participant(s)	Promotora Ambiental de la Laguna S.A de C.V Gazprom Marketing & Trading Limited
Host Party(ies)	Mexico (Host)
Sectoral scope(s) and applied methodology(ies)	Sectoral scopes: • Sectoral scope 13 : Waste handling and disposal Methodologies applied to the project activity: • ACM0001 ver. 11 - Consolidated baseline and monitoring methodology for landfill gas project activities
Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD	67,849[1] tCO_2e
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	18,388 tCO_2e
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period up to 31 December 2012(if applicable)	6,778 tCO_2e
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period from 1 January 2013 onwards (if applicable).	11,610 tCO_2e

[1] The values in the ex-ante calculation of the registered CDM-PDD are 49,373 tCO_2e for 2012 (366 days) and 46,541 tCO_2e for 2013 (365 days). The average for both years equates to 131 tCO_2e/day, which multiplied by 518 days of the current monitored period, equates to 67,849 tCO_2e.

SECTION A. Description of project activity

A.1. Purpose and general description of project activity

a) Purpose of the project activity and the measures taken for GHG emission reductions or net anthropogenic GHG removals by sinks;

The objective of Culiacan Northern Landfill Gas Project is to capture the landfill gas (LFG) and to flare and/or utilize it leading to GHG emissions reductions. The principal components of landfill gas are methane (CH_4) and carbon dioxide (CO_2), both of which are greenhouse gases (GHG) listed as such in the Kyoto Protocol.

b) Brief description of the installed technology and equipment;

Before the project implementation, the most likely scenario was the atmospheric release of landfill gas generated at the landfill site with no landfill gas capture and destruction. During this third monitoring period, the project activity has continued the operation of a landfill gas (LFG) collection and flare system. The purpose of LFG flaring is to safely dispose of the flammable constituents, particularly methane, and to control odour nuisance, health risks and adverse environmental impacts. This phase has involved the investment in a highly efficient landfill gas collection system and the required enclosed flaring equipment.

In particular, the installed equipment of the project activity is composed by a LFG Collection System and a LFG Flare System. The LFG Collection System is composed by deep and shallow vertical wells installed in intermediate or closed areas of the Culiacan Landfill site and interconnected by a piping network for serving the blower station with a specific diameter piping, suitable for the anticipated flow rates. The LFG Flare System is composed by an enclosed ZTOF Biogas Flare which is equipped with all the monitoring equipment as per the methodology requirements including continuous exhaust gas monitoring. The LFG has been only flared during the monitoring period. Eventually, it is expected to install LFG Power Generation equipment. From then on, LFG would be used to generate electricity and only send the excess LFG to the flare. Thus all LFG will be combusted in one of these two ways and methane contained in LFG would be destroyed.

c) Relevant dates for the project activity (e.g. construction, commissioning, continued operation periods, etc.);

11/01/2010:	Commissioning of the LFG Flare System of Culiacan Landfill Gas Project;
09/07/2010:	Project registration date with Executive Board of United Nation Framework for Climate Change Convention (UNFCCC)
09/07/2010:	Start date (day included) of the 1st Monitoring period.
30/06/2011:	End date (day included) of the 1st Monitoring period.
01/07/2011:	Start date (day included) of the 2nd Monitoring period.
31/07/2012:	End date (day included) of the 2nd Monitoring period.

d) Total GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period.

The total emission reductions achieved during the third monitoring period from 01/08/2012 to 31/12/2013 (both days included) are 18,388 tCO_2e.

A.2. Location of project activity

The Culiacan Northern Landfill is located at Km. 2.5, Pitayita way, without number, in the City of Culiacan, Sinaloa State, Mexico. The geographic coordinates of the site are the parallel 24°52'50.46" Northern Latitude (N.L.) and meridian 107°22'04.51" West Longitude (W.L.). The GPS coordinates were taken from the center point of Culiacan Northern Landfill, based on the latest version of the registered CDM-PDD.

A.3. Parties and project participant(s)

Party involved ((host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Mexico (host)	Promotora Ambiental de la Laguna S.A. de C.V	No
United Kingdom of Great Britain and Northern Ireland	Gazprom Marketing & Trading Limited	No

Hired by Promotora Ambiental de la Laguna S.A. de C.V. as CDM Consultant, the entity responsible for completing the monitoring report form (CDM-MR) is ClimaLoop. The responsible person is Sergi Cuadrat, Climate Change Mitigation Consultant of ClimaLoop. His contact details are:

Address: Travessera de Sant Pau, 1. Post Code 43202, Reus. Spain.
Tel: +34 636 075 989
Website: www.climaloop.com
Email: sergi.cuadrat@climaloop.com

A.4. Reference of applied methodology

The baseline and monitoring methodology applied for the proposed project activity is the approved consolidated baseline methodology ACM0001, version 11 (EB47): "*Consolidated baseline and monitoring methodology for landfill gas project activities*". Moreover, the following tools have been applied to the project activity to calculate the emission reductions for the monitoring period:

- In order to determine the flare efficiency and/or to monitor the flare exhaust gases the version 1 of the "Tool to determine project emissions from flaring gases containing methane" is applied. References to this tool in the formulae are marked as T.
- In order to determine emissions associated with electricity consumption in the project scenario, the version 1 of "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" is applied. References to this tool in the formulae are marked as TE.
- The version 2 of the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" is applied in case any fossil fuels are used on site. References to this tool in the formulae are marked as TF.

The registered CDM-PDD also used the following tools, which have not been used to calculate the emission reductions for the monitoring period:

- "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site". Version 4.
- "Combined tool to identify the baseline scenario and demonstrate additionality". Version 2.2
- "Tool to calculate the emission factor for an electricity system". Version 1.1
- "Tool for the demonstration and assessment of additionality". Version 5.2

The methodologies and tools applied to the project activity can be found in the UNFCCC webpage: http://cdm.unfccc.int/methodologies/PAmethodologies/approved

A.5. Crediting period of project activity

The first crediting period corresponding to this monitoring period commence from the date of registration that is from 09/07/2010 and will last till 08/07/2020 (fixed).

SECTION B. Implementation of project activity

B.1. Description of implemented registered project activity

a) Description of the installed technology, technical processes and equipments;

The Culiacan Northern Landfill was opened in 1992, as a controlled dump. The total amount of waste disposed was approximately 2.86 million tons at the end of 2008. Until 2007, the site received about 850 tons of municipal solid waste (MSW) daily. Nowadays, the operation of the landfill is located in Cell 6 and receives about 700 tons of waste a day with an expected landfill lifetime ending in the year 2017.

Before the project implementation, the most likely scenario was the atmospheric release of landfill gas generated at the landfill site with no landfill gas capture and destruction. The project activity was designed in two phases:

1. The first phase included the construction and operation of a landfill gas (LFG) collection and flare system. The purpose of LFG flaring is to safely dispose of the flammable constituents, particularly methane, and to control odour nuisance, health risks and adverse environmental impacts. This phase has involved the investment in a highly efficient landfill gas collection system and the required enclosed flaring equipment.

2. Once the LFG flow is proven to be steady (in terms of volume and quality) for the electricity generation, a second project phase would be carried out and a reciprocating engine facility will be installed. This phase would imply the installation of generating equipment that would combust the methane of the LFG in order to produce electricity.

The Culiacan Northern Landfill Gas Project is currently operating in its first phase. The installed equipment in the Culiacan Northern Landfill is composed by a LFG Collection System and a LFG Flare System. In order to maximize LFG recovery rates, and thus GHG emission reductions, an active LFG Collection System has been installed. The system consists of a series of vertical extraction wells interconnected by header piping. The LFG is extracted from the landfill by a set of blowers[2] to be initially flared in the LFG Flare System. Once LFG gas recovery is considered to be stationary and proper dimensioning can be conducted, project proponent would install LFG Power Generation equipment. During the current monitored period, LFG has only been flared. The following diagram represents the technology applied in the Culiacan Landfill Gas Project:

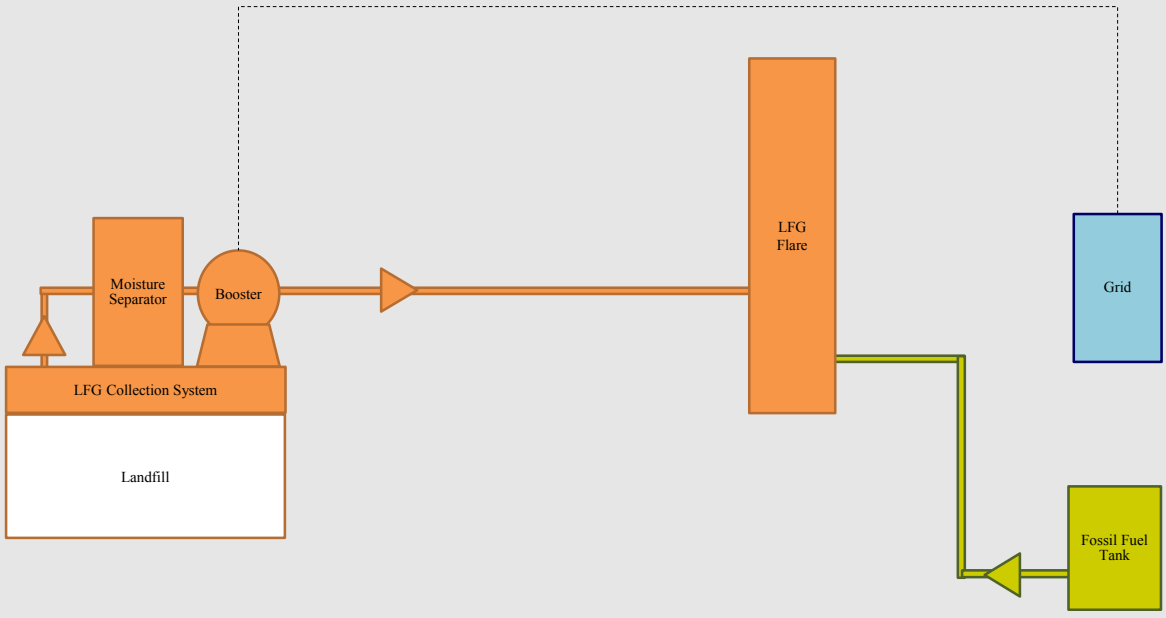


Figure 1. Diagram of the technology applied in the Culiacan Landfill Gas Project.

[2] The PDD assumed the installation of two blowers with 25 HP each whereas finally, two blowers with 30 HP each were installed. The monitored value of on-site consumption of electricity provided by the grid attributable to the project activity ($EC_{PJ,y}$) considering the two blowers of 30 HP each is used for the calculation of the project emissions from electricity consumption by the project activity ($PE_{EC,y}$). N

The essential characteristics of the technology applied during the monitoring period for the LFG collection and flaring systems are:

I. **LFG Collection System:** The LFG collection system is composed by:

- Deep and shallow vertical wells in intermediate or closed areas have been installed, trying not to interfere with landfill operation. Depending on future development plans, some horizontal wells might be installed to capture the gas in areas that continue to be filled;
- A piping network has been installed to include connection to extraction wells for serving the blower station with a specific diameter piping, suitable for the anticipated flow rates. Connection has been made to those extraction wells that have been constructed to final or intermediate grade, and to which the piping connection have a minimal impact on current filling operations.

II. **LFG Flare System:** The John Zink Biogas Flare System has been installed in the project activity and consists of:

- An Enclosed ZTOF Biogas Flare which offers automated operation and is designed to destroy safely, with automatic temperature control, typical organic compounds generated by solid waste and other biogas processes. The flare system is controlled with a processor, or programmable logic controller (PLC), which receives and transmits signals with respect to operating conditions. If an unacceptable operating condition occurs, the control system discontinues flow of biogas or adjusts the operating parameters to correct the problem. Control of the Enclosed ZTOF Biogas Flare includes an initial purge cycle, automatic ignition sequence, and fail-safe controls. A self-checking flame scanner monitors the pilot flame and main flame and safety shutdown features prevent equipment damage. The Enclosed ZTOF Biogas Flare is equipped with all the monitoring equipment as per the methodology requirements including continuous exhaust gas monitoring.
- A skid assembly containing a panel rack with flare control panel, a moisture separator, and a blower station. The blower station has been installed to provide the necessary suction pressure for the flare and considering future electricity generator flow demands.

b) Information on the implementation and actual operation of the project activity, including relevant dates (e.g. construction, commissioning, continued operation periods, etc.).

The LFG Flare System of el Culiacan Northern Landfill was commissioned on 12th January 2010 and has been operating since then in its first phase (flaring only). The second phase of the project activity, that is electricity generation using LFG, is not in place yet, such that all LFG gas collected during this monitoring period has been flared.

The project was fully operational by the date of registration on 9th July 2010. Since its registration date it has been implemented and monitored as per the monitoring plan of the PDD, with continuous operation.

The events of the actual operation of the "Culiacan Northern Landfill Gas Project" project during the second monitoring period have been summarized in the following table:

Table 1. Information regarding the actual operation of the Culiacán Landfill Gas Project

From	To	Duration (days)	Event of actual operation[3]	Type of Event
07/12/2013 21:30	09/12/2013 08:15	1.45	Power outage from CFE (national electricity provider).	Power Outage
15/11/2013 16:03	19/11/2013 17:06	4.04	Failure in sending the data from the Automatic Continuous Data Gathering System	System Failure
12/10/2013 09:36	25/10/2013 10:08	13.02	Failure in sending the data from the Automatic Continuous Data Gathering System	System Failure
08/10/2013 01:58	12/10/2013 09:36	4.32	Failure in sending the data from the Automatic Continuous Data Gathering System	System Failure
26/09/2013 08:20	06/12/2013 12:16	71.16	Failure in sending the data from the Automatic Continuous Data Gathering System	System Failure
24/09/2013 18:49	26/09/2013 07:09	1.51	Failure in sending the data from the Automatic Continuous Data Gathering System	System Failure
19/09/2013 06:07	20/09/2013 08:58	1.12	Failure in sending the data from the Automatic Continuous Data Gathering System	System Failure
04/09/2013 21:13	05/09/2013 17:42	0.85	The main line of the LFG collection system is repaired.	Service / Maintenance
11/08/2013 19:34	13/08/2013 07:54	1.51	Failure in sending the data from the Automatic Continuous Data Gathering System	System Failure
04/08/2013 09:00	05/08/2013 09:01	1.00	Power outage from CFE (national electricity provider).	Power Outage
23/06/2013 11:58	25/06/2013 10:46	1.95	The main line of the LFG collection system is repaired.	Service / Maintenance
14/06/2013 00:06	14/06/2013 19:21	0.80	Power outage from CFE (national electricity provider).	Power Outage
09/06/2013 07:30	10/06/2013 07:43	1.01	Power outage from CFE (national electricity provider).	Power Outage
03/06/2013 17:26	04/06/2013 19:20	1.08	Power outage from CFE (national electricity provider).	Power Outage
11/05/2013 16:41	13/05/2013 07:30	1.62	Power outage from CFE (national electricity provider).	Power Outage
04/05/2013 18:44	06/05/2013 07:58	1.55	Power outage from CFE (national electricity provider).	Power Outage
03/03/2013 00:16	04/03/2013 07:58	1.32	Power outage from CFE (national electricity provider).	Power Outage
25/01/2013 16:04	26/01/2013 19:10	1.13	Failure in sending the data from the Automatic Continuous Data Gathering System	System Failure
10/12/2012 11:42	15/12/2012 07:42	4.83	Failure in sending the data from the Automatic Continuous Data Gathering System	System Failure
08/12/2012 17:41	10/12/2012 22:01	2.18	Power outage from CFE (national electricity provider).	Power Outage
07/10/2012 11:25	08/10/2012 07:36	0.84	Blower failure	System Failure
12/09/2012 22:39	18/09/2012 15:34	5.70	Failure in sending the data from the Automatic Continuous Data Gathering System	System Failure

[3] Arbitrarily, only events with more than 18 hours of duration have been included in the table.

c) Description of events or situations that occurred during the monitoring period that may impact the applicability of the methodology and how the issues resulting from these events or situations are being addressed:

During the monitoring period, there were not major events or situations that affected the applicability of the methodology.

B.2. Post registration changes

B.2.1. Temporary deviations from registered monitoring plan or applied methodology

Not applicable. The section is left blank intentionally.

B.2.2. Corrections

Not applicable. The section is left blank intentionally.

B.2.3. Permanent changes from registered monitoring plan or applied methodology

Not applicable. The section is left blank intentionally.

B.2.4. Changes to project design of registered project activity

Not applicable. The section is left blank intentionally.

B.2.5. Changes to start date of crediting period

Not applicable. The section is left blank intentionally.

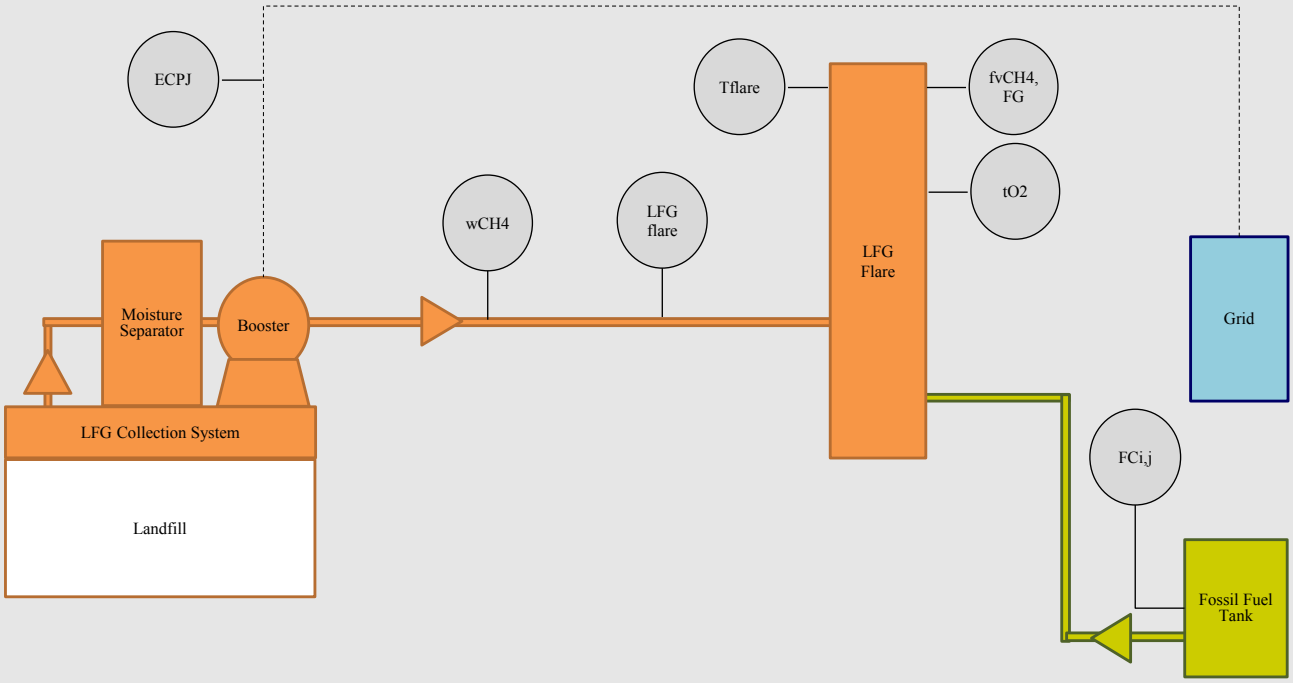
B.2.6. Types of changes specific to afforestation or reforestation project activity

Not applicable. The section is left blank intentionally.

SECTION C. Description of monitoring system

The following section provides a description of the monitoring system including data collection procedures (information flow including data generation, aggregation, recording, calculation and reporting), organizational structure, roles and responsibilities of personnel, and emergency procedures for the monitoring system for the Culiacan Landfill Project:

a) Line diagram showing all relevant monitoring points: The following line diagram shows the monitoring points applied in the Culiacan Landfill Gas Project during the monitoring period:



b) Data collection procedures: The following points provide a description of the data collection procedures followed by the Culiacan Landfill Project during the monitoring period:

a) Data generation: The data generation for the Culiacan Landfill Gas Project is using both Automatic Continuous and Manual Periodic (Daily) Data Gathering System as follows:

- Manual Periodic (Daily) Data Gathering System: The following parameters are gathered manually in daily log sheets:

Table 2. Parameters gathered manually in Culiacán LFS

Parameter	Data unit	Description of the parameter
$EC_{PJ,y}$	MWh	On-site consumption of electricity provided by the grid attributable to the project activity
$FC_{i,j,y}$	m^3	Quantity of fuel type i combusted in process j

- Automatic Continuous Data Gathering System: In normal operating conditions, data has been recorded every two minutes electronically and it will be kept during the crediting period and two years after. The company LANDTEC is responsible to aggregate monthly the raw data and transmits these through Excel file to PASA. The following parameters are gathered automatically under such procedure:

Table 3. Parameters gathered automatically in Culiacán LFS.

Parameter	Data unit	Description of the parameter
$LFG_{flare,y}$	Nm^3	Amount of landfill gas flared at normal temperature and pressure
w_{CH4}	m^3 CH_4 / m^3 LFG	Methane fraction in the landfill gas.
$t_{O2,h}$	%	Volumetric fraction of O_2 in the exhaust gas of the flare.
$fv_{CH4,FG,h}$	mg/m^3	Concentration of methane in the exhaust gas of the flare in dry basis at normal conditions
T_{flare}	ºC	Temperature in the exhaust gas of the flare.

b) Data aggregation: The data is aggregated monthly in a Monthly Report which is presented to the Board of Promotora Ambiental S.A. de C.V (PASA) as per internal procedures.

c) Data recording: The data which is gathered automatically is recorded in monthly spreadsheets while the data gathered manually is recorded both in paper forms and in spreadsheets. Promotora Ambiental S.A. de C.V (PASA) has an in-house back-up system to record the data during the crediting period. In parallel, LANDTEC provides support to back-up the automatic raw data.

d) ER calculation and reporting: The gathered data is used to calculate the Emission Reductions (ER) as per the applicable methodologies and the registered PDD and these are reported in the CDM-MR. Previous to this process, a QA/QC procedure is used with the aim of disregard any raw data in the same time interval which do not accomplish the following three operational conditions at the same time:
- Condition 1: The $LFG_{flare.y}$ should be between 150 and 1,500 Nm^3/h
- Condition 2: The w_{CH4} should be between 25 and 75% in CH_4
- Condition 3:The T_{flare} should be between 500 and 1,200ºC.

The following scheme simplifies the Data collection procedures followed in the Culiacan Landfill Gas Project during the monitoring period:

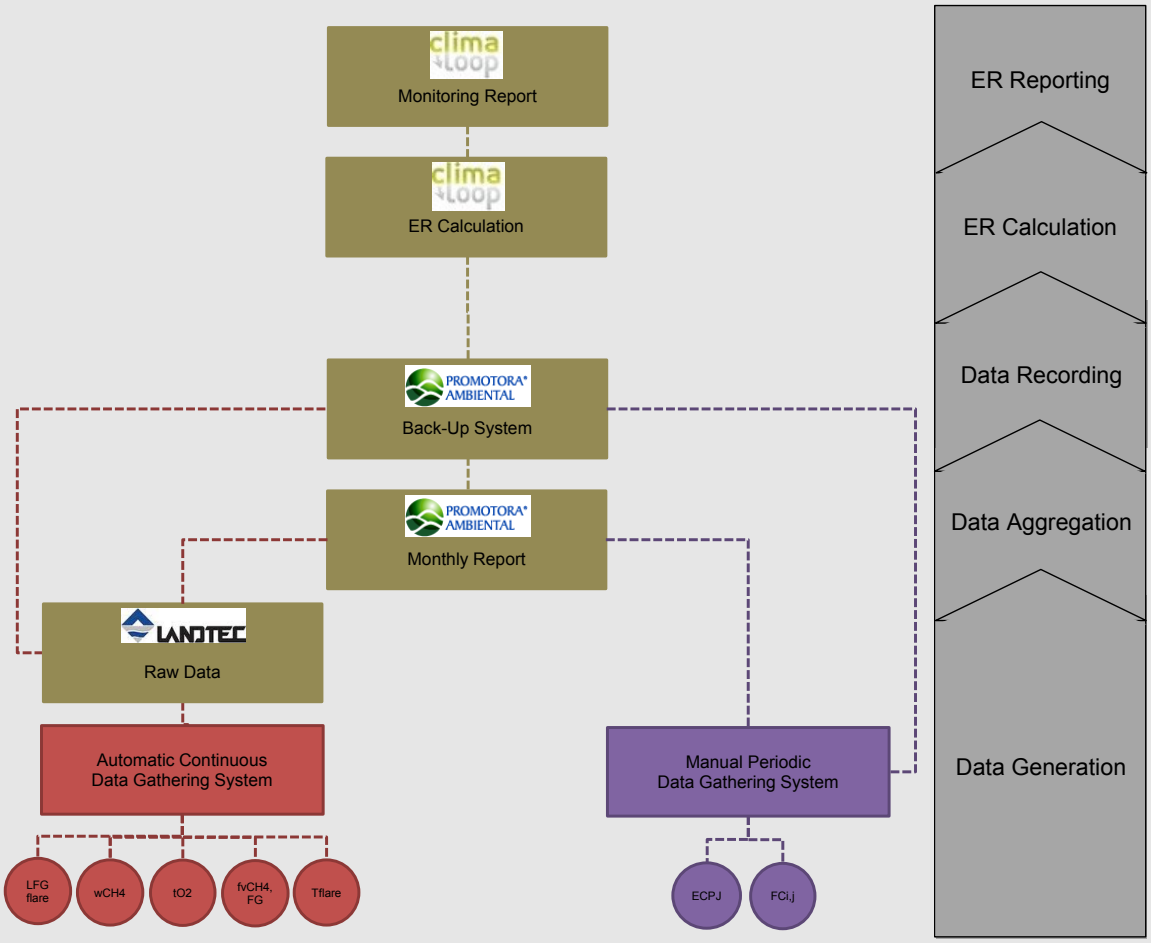


Figure 2. Scheme of the data collection procedures for Culiacan Landfill Gas Project.

As shown in the scheme above, the Data collection procedures in the Culiacan Landfill Gas Project are divided in an Automatic Continuous Data Gathering System (which gathers the parameters $LFG_{flare,y}$, w_{CH4}, t_{O2}, fv_{CH4FG} and T_{flare}) and a Manual Periodic Data Gathering System (which gathers the parameters $EC_{PJ,y}$ and $FC_{i,j,y}$). Once the data is collected, it is aggregated in a monthly basis to report the expected CER generation to PASA´s Board. Once data is archived in back-up system of the facility, all data is sent to the CDM Consultant to conduct the ER calculations and the preparation of the Monitoring Report (CDM-MR).

c) **Organizational structure, roles and responsibilities:** The following list simplifies the responsibilities allocated of each role during the monitoring period:

Table 4. Roles and responsibilities in the Culiacan Landfill Gas Project.

Name	Role	Organization	Process Involvement
Jesus Garcia Castro	Field Technician	PASA	Data Collection
Israel Garcia Illescas	Field support	PASA	
Ricardo Lopez Loredo	Landfill Sites Manager	PASA	Data Aggregation
Reynaldo Hernández	Monitoring and Biogas Manager	PASA	Data Recording
Sergi Cuadrat	CDM Consultant	ClimaLoop	ER Calculation and Reporting

The following scheme simplifies the Organizational Structure followed by the Culiacan Landfill Gas Project:

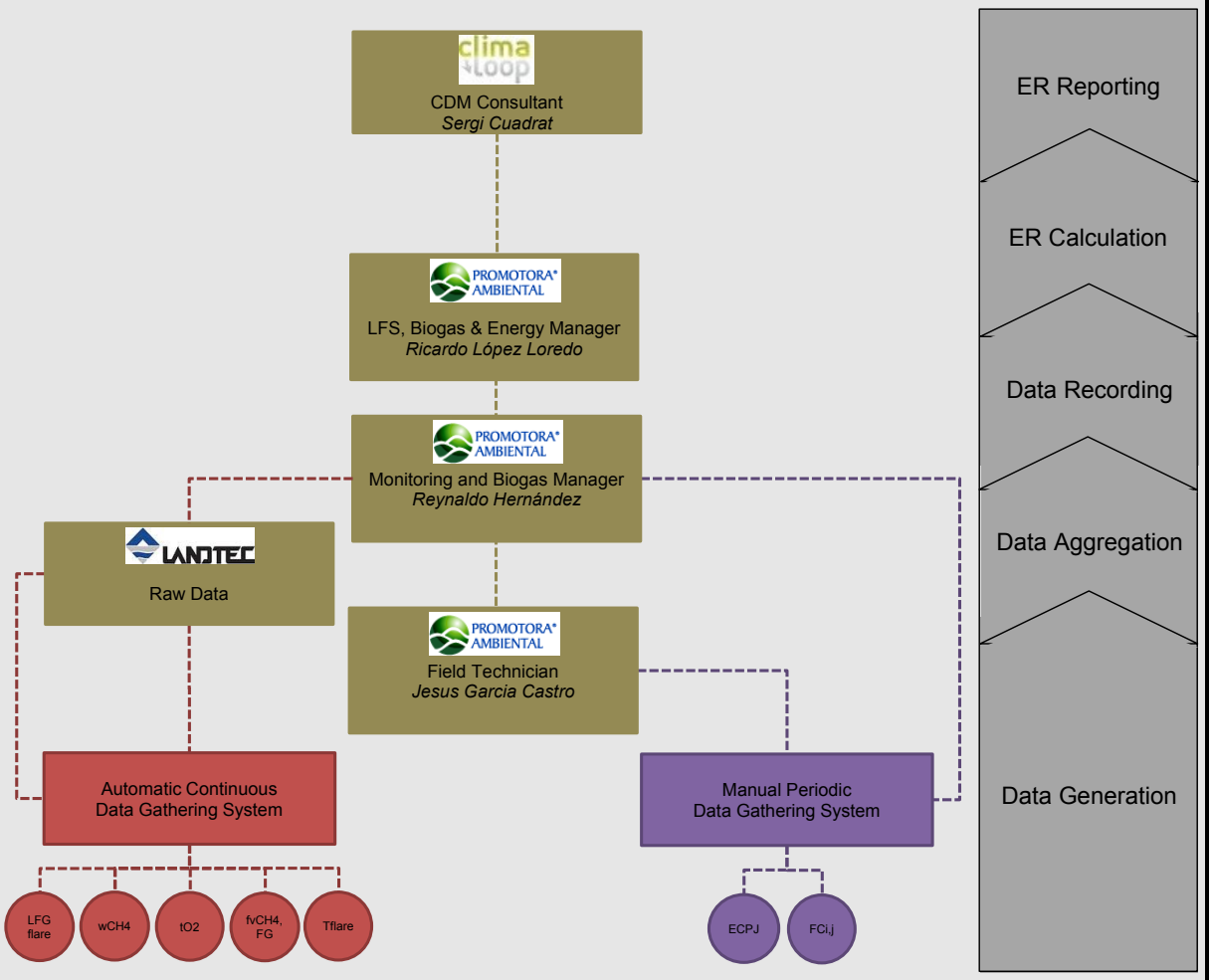


Figure 3. Organizational Structure followed in Culiacan Landfill Gas Project.

The Field Technician is the responsible to conduct the day-to-day operation of equipment and collects data under the Manual Periodic Data Gathering System. The Monitoring and Biogas Manager supervises all CDM activities such as data collection, aggregation and recording and reports to the Landfill Sites, Biogas and Energy Manager who supervises the project activity. Finally, the CDM Consultant is responsible for the CERs calculations and elaborates the Monitoring Report.

d) **The responsibilities and authorities for monitoring and reporting:** The following list simplifies the responsibilities allocated of each role during the monitoring period:

- Field Technician
  - ✓ Checks day-to-day operation of equipment.
  - ✓ Conduct the required maintenance as per predefined schedule.
  - ✓ Executes the calibration of equipment with procedures and frequency established.
  - ✓ Collects data under the Manual Periodic Data Gathering System (which gathers the parameters $EC_{PJ,y}$ and $FC_{i,j,y}$) in paper registries and transfers to electronic registries.
- Automatic Continuous Data Gathering System provider (LANDTEC)
  - ✓ Aggregates the raw data gathered by the Automatic Continuous Data Gathering System.
  - ✓ Transmits raw data gathered in a monthly basis through Excel file to PASA.
  - ✓ Provides support to back-up the automatic raw data.
- Monitoring and Biogas Manager
  - ✓ Supervises the general operations.
  - ✓ Supervises all CDM activities such as data collection, aggregation and recording.
  - ✓ Supervision of Automatic Continuous Data Gathering System.
  - ✓ Ensures that data is collected as per the registered PDD.

- ✓ Manages the calibration of equipment with procedures and frequency established.
- ✓ Ensures proper Back-Up of the Raw Data and CDM Documentation.
- ✓ Sends Raw Data to CDM Consultant.

- Landfill Sites, Biogas and Energy Manager
  - ✓ Supervises the project activity.
  - ✓ Takes major decisions when required (equipment repair/replacement, improvements, etc).

- CDM Consultant
  - ✓ Performs the CERs calculations;
  - ✓ Performs internal audits of the project;
  - ✓ Elaborates the Monitoring Report;
  - ✓ Supports the project during the verification site visits.

e) Emergency procedures for the monitoring system:

The emergency procedures for the monitoring system in the Culiacan Landfill Gas Project consist in daily checks of the project activity equipment and meters. If any problem occurs, the responsible personnel take the required action to solve the problem. If a malfunction on meters or equipment occurs, no CERs are claimed for the corresponding period.

SECTION D. Data and parameters

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

Data / Parameter:	**$\rho_{CH4,n}$**
Unit:	kg/m^3
Description:	Density of methane gas at normal conditions
Source of data:	"Tool to determine project emissions from flaring gases containing methane" (ver. 1)
Value(s) applied):	0.716
Purpose of data:	Baseline
Additional comment:	The value of $\rho_{CH4,n}$ has been referred with three significant digits as 0.716 kg/m^3 as per the "Tool to determine project emissions from flaring gases containing methane" (ver. 1)

Data / Parameter:	**D_{CH4}**
Unit:	tCH_4/m^3CH_4
Description:	Methane density at normal temperature and pressure (0°C and 1.013 bar)
Source of data:	ACM0001 Version 11 "Consolidated baseline and monitoring methodology for landfill gas project activities"
Value(s) applied):	0.0007168
Purpose of data:	Baseline
Additional comment:	The value of D_{CH4} has been referred with four significant digits as 0.0007168 tCH_4/m^3CH_4 as per the ACM0001 Version 11 "Consolidated baseline and monitoring methodology for landfill gas project activities"

Data / Parameter:	**AM_C**
Unit:	kg/kmol
Description:	Atomic mass of carbon
Source of data:	"Tool to determine project emissions from flaring gases containing methane" (ver. 1)
Value(s) applied):	12
Purpose of data:	Baseline
Additional comment:	No additional comments have been found to be necessary

Data / Parameter:	**AM_H**
Unit:	kg/kmol
Description:	Atomic mass of hydrogen
Source of data:	"Tool to determine project emissions from flaring gases containing methane" (ver. 1)
Value(s) applied):	1.01
Purpose of data:	Baseline
Additional comment:	No additional comments have been found to be necessary

Data / Parameter:	AM_O
Unit:	kg/kmol
Description:	Atomic mass of oxygen
Source of data:	"Tool to determine project emissions from flaring gases containing methane" (ver. 1)
Value(s) applied):	16
Purpose of data:	Baseline
Additional comment:	No additional comments have been found to be necessary

Data / Parameter:	AM_N
Unit:	kg/kmol
Description:	Atomic mass of nitrogen
Source of data:	"Tool to determine project emissions from flaring gases containing methane" (ver. 1)
Value(s) applied):	14.01
Purpose of data:	Baseline
Additional comment:	No additional comments have been found to be necessary

Data / Parameter:	$NA_{C,CH4}$
Unit:	Atoms
Description:	Number of atoms of carbon in CH_4
Source of data:	"Tool to determine project emissions from flaring gases containing methane" (ver. 1)
Value(s) applied):	1
Purpose of data:	Baseline
Additional comment:	No additional comments have been found to be necessary

Data / Parameter:	$NA_{N,N2}$
Unit:	Atoms
Description:	Number of atoms of nitrogen in N2
Source of data:	"Tool to determine project emissions from flaring gases containing methane" (ver. 1)
Value(s) applied):	2
Purpose of data:	Baseline
Additional comment:	No additional comments have been found to be necessary

Data / Parameter:	MM_{CH4}
Unit:	kg/kmol
Description:	Molecular mass of methane
Source of data:	"Tool to determine project emissions from flaring gases containing methane" (ver. 1)

Value(s) applied):	16.04
Purpose of data:	Baseline
Additional comment:	No additional comments have been found to be necessary

Data / Parameter:	**MM_{N2}**
Unit:	kg/kmol
Description:	Molecular mass of nitrogen
Source of data:	"Tool to determine project emissions from flaring gases containing methane" (ver. 1)
Value(s) applied):	28.02
Purpose of data:	Baseline
Additional comment:	No additional comments have been found to be necessary

Data / Parameter:	**MVn**
Unit:	m^3/Kmol
Description:	Volume of one mole of any ideal gas at normal temperature and pressure
Source of data:	"Tool to determine project emissions from flaring gases containing methane" (ver. 1)
Value(s) applied):	22.414
Purpose of data:	Baseline
Additional comment:	No additional comments have been found to be necessary

Data / Parameter:	**MF_{O2}**
Unit:	m^3/Kmol
Description:	O_2 volumetric fraction of air
Source of data:	"Tool to determine project emissions from flaring gases containing methane" (ver. 1)
Value(s) applied):	0.21
Purpose of data:	Baseline
Additional comment:	No additional comments have been found to be necessary

Data / Parameter:	**Pn**
Unit:	Pa
Description:	Atmospheric pressure at normal conditions
Source of data:	"Tool to determine project emissions from flaring gases containing methane" (ver. 1)
Value(s) applied):	101 325
Purpose of data:	Baseline
Additional comment:	No additional comments have been found to be necessary

Data / Parameter:	**Ru**
Unit:	Pa m^3/kmol K

Description:	Universal ideal gas constant
Source of data:	"Tool to determine project emissions from flaring gases containing methane" (ver. 1)
Value(s) applied):	8 314.472
Purpose of data:	Baseline
Additional comment:	No additional comments have been found to be necessary

Data / Parameter:	**Tn**
Unit:	K
Description:	Temperature at normal conditions
Source of data:	"Tool to determine project emissions from flaring gases containing methane" (ver. 1)
Value(s) applied):	273.15
Purpose of data:	Baseline
Additional comment:	No additional comments have been found to be necessary

Data / Parameter:	**GWP_{CH4}**
Unit:	tCO_2e/tCH_4
Description:	Global Warming Potential of CH_4
Source of data:	2006 IPCC value
Value(s) applied):	21
Purpose of data:	Baseline
Additional comment:	Shall be updated according to any future COP/MOP decisions.
	No additional comments have been found to be necessary

Data / Parameter:	**AF**
Unit:	%
Description:	Adjustment factor (for methane destruction in the baseline)
Source of data:	Estimated if there is a contractual or regulations requirements
Value(s) applied):	0
Purpose of data:	Baseline
Additional comment:	The regulatory requirements do not indicate any specific amount of landfill gas to collect and destruct or for its utilization. There are no registered amounts of landfill gas that are actually burned at the Culiacan Northern Landfill Gas Project; in any case, only passive venting is used for safety purposes and no methane destruction is occurring previous to the project activity. With these facts, an adjustment factor of 0% is the most proper value to be adopted.

Data / Parameter:	**Carbon Emisssion Factor CEFelec,BL,y = EFgrid,CM,y**
Unit:	tCO_2e/MWh
Description:	CO_2 emissions intensity of the electricity displaced

Source of data:	As shown in the PDD, the emissions factor was calculated using the version 1.1 of the "Tool to calculate the emission factor for an electricity system", recommended by ACM0001 Ver.11.
Value(s) applied):	0.538
Purpose of data:	Project
Additional comment:	A single, fixed value is used for each crediting period.

Data / Parameter:	**Regulatory requirements relating to landfill gas projects**
Unit:	Dimensionless
Description:	Regulatory requirements relating to landfill gas projects
Source of data:	Publicly available information of the host country's regulatory requirements relating to landfill gas.
Value(s) applied):	0%
Purpose of data:	Baseline
Additional comment:	The information though recorded annually, is used for changes to the adjustment factor (AF) or directly MDBL,y at renewal of the credit period.

D.2. Data and parameters monitored

Data / Parameter:	**$LFG_{total,y}$**	
Unit	Nm^3	
Description	Total amount of landfill gas captured at normal temperature and pressure	
Measured/Calculated /Default	When installed, it will be measured by a mass flow meter	
Source of data	Automatic Data Gathering System	
Value(s) of monitored parameter		Not installed
Monitoring equipment	Type	Not installed
	Accuracy class	Not installed
	Manufacturer	Not installed
	Model	Not installed
	Serial Number	Not installed
	Calibration Frequency	Not installed
	Date of last calibration	Not installed
	Validity of last calibration	Not installed
	Installation date	Not installed
	Validity of calibration runs from	Not installed
Measuring/Reading/ Recording frequency	Continuous mass flow meters will be used to measure flow rates. In normal operating conditions, will be recorded every two minutes electronically and it will be kept during the crediting period and two years after. Data will be also aggregated monthly.	
Calculation method (if applicable)	Not used	
QA/QC procedures	Flow meters will be subject to regular maintenance and testing regime to ensure accuracy. The same basis (dry or wet) as CH_4 concentration is considered for this measurement when the residual gas temperature exceeds 60ºC.	
Purpose of data	Not used	
Additional comment	No separate monitoring of temperature and pressure will be necessary because the project activity will be using flow meters that automatically compensate for temperature and pressure, expressing LFG volumes in normalized cubic meters (Nm^3). The meter will be installed once the project achieves its second phase (LFG electricity generation). The project is operating under first phase (only flaring) during the 2nd Monitoring period so this parameter is not monitored.	

Data / Parameter:	**$LFG_{flare,y}$**	
Unit	Nm^3	
Description	Amount of landfill gas flared at normal temperature and pressure	
Measured/Calculated /Default	Measured by a mass flow meter	
Source of data	Automatic Data Gathering System	
Value(s) of monitored parameter		2,980,583
Monitoring equipment	**Equipment 1**	
	Type	LFGflare_Flowmeter
	Accuracy class	± 1% Full Scale
	Manufacturer	Thermal Instruments
	Model	62-9/9500
	Serial Number	2010313
	Calibration Frequency	18 months
	Date of last calibration	24/08/2010
	Validity of last calibration	20/06/2012
	Installation date	21/12/2010
	Validity of calibration runs from	Installation date
	Equipment 2	
	Type	LFGflare_Flowmeter
	Accuracy class	± 1% Full Scale
	Manufacturer	Thermal Instruments
	Model	62-9/9500
	Serial Number	2008364
	Calibration Frequency	18 months
	Date of last calibration	07/10/2011
	Validity of last calibration	19/12/2013
	Installation date	20/06/2012
	Validity of calibration runs from	Installation date
Measuring/Reading/ Recording frequency	Continuous mass flow meters have been used to measure flow rates. In normal operating conditions, data has been recorded every two minutes electronically and it will be kept during the crediting period and two years after. Data has been also aggregated monthly.	
Calculation method (if applicable)	The value of the monitored value shown in this table is the result of the accumulated flow in which raw data in the same time interval accomplish the following three operational conditions at the same time: • Condition 1: The $LFG_{flare.y}$ should be between 150 and 1,500 Nm^3/h • Condition 2: The w_{CH4} should be between 25 and 75% in CH_4 • Condition 3:The T_{flare} should be between 500 and 1,200ºC.	
QA/QC procedures	Flow meters have been subject to regular maintenance and testing regime to ensure accuracy. The same basis (dry or wet) as CH_4 concentration is considered for this measurement when the residual gas temperature exceeds 60ºC. QA/QC procedure is used with the aim of disregard any raw data in the same time interval which do not accomplish the following three operational conditions at the same time: • Condition 1: The $LFG_{flare.y}$ should be between 150 and 1,500 Nm^3/h • Condition 2: The w_{CH4} should be between 25 and 75% in CH_4 • Condition 3:The T_{flare} should be between 500 and 1,200ºC	
Purpose of data	Baseline	

Additional comment	No separate monitoring of temperature and pressure have been necessary because the project activity is using flow meters that automatically compensate for temperature and pressure, expressing LFG volumes in normalized cubic meters (Nm^3). The meter has been installed in this first phase of the project activity in the main line between the flare and the booster (after the Field Analyser Unit). The project is operating under first phase (only flaring) during the 2nd Monitoring period and that is why it is monitored.

Data / Parameter:	**$LFG_{electricity,y}$**	
Unit	Nm^3	
Description	Amount of landfill gas combusted in power plant at normal temperature and pressure	
Measured/Calculated /Default	When installed, it will be measured by a mass flow meter	
Source of data	Automatic Data Gathering System	
Value(s) of monitored parameter		Not installed
Monitoring equipment	Type	Not installed
	Accuracy class	Not installed
	Manufacturer	Not installed
	Model	Not installed
	Serial Number	Not installed
	Calibration Frequency	Not installed
	Date of last calibration	Not installed
	Validity of last calibration	Not installed
	Installation date	Not installed
	Validity of calibration runs from	Not installed
Measuring/Reading/ Recording frequency	Continuous mass flow meters will be used to measure flow rates combusted in power plant at normal temperature and pressure when installed. In normal operating conditions, data will be recorded every two minutes electronically and it will be kept during the crediting period and two years after. Data will also be aggregated monthly.	
Calculation method (if applicable)	Not used	
QA/QC procedures	Flow meters will be subject to regular maintenance and testing regime to ensure accuracy. The same basis (dry or wet) as CH_4 concentration will be considered for this measurement when the residual gas temperature exceeds 60ºC.	
Purpose of data	Not used	
Additional comment	No separate monitoring of temperature and pressure will be necessary because the project activity will be using flow meters that automatically compensate for temperature and pressure, expressing LFG volumes in normalized cubic meters (Nm^3). The meter will be installed once the project achieves its second phase of the project activity (LFG electricity generation). The project is operating under first phase (only flaring) during the 2nd Monitoring so this parameter is not monitored.	

Data / Parameter:	w_{CH4}	
Unit	m^3 CH_4 / m^3 LFG	
Description	Methane fraction in the landfill gas.	
Measured/Calculated /Default	Measured by a gas analyzer	
Source of data	Automatic Data Gathering System	
Value(s) of monitored parameter		43.4%
	Equipment 1	
	Type	Field Analyser Unit (FAU)
	Accuracy class	± 0.2% to ± 1% (0 to full scale)
	Manufacturer	Landtec
	Model	FAU
	Serial Number	GA08901
	Calibration Frequency	6 months
	Date of last calibration	29/11/2011
	Validity of last calibration	16/09/2013
	Installation date	17/03/2013
	Validity of calibration runs from	Installation date
	Equipment 2	
	Type	Field Analyser Unit (FAU)
	Accuracy class	± 0.2% to ± 1% (0 to full scale)
	Manufacturer	Landtec
	Model	FAU
	Serial Number	GA08754
	Calibration Frequency	6 months
	Date of last calibration	29/03/2012
	Validity of last calibration	16/01/2013
	Installation date	17/07/2012
	Validity of calibration runs from	Installation date
Measuring/Reading/ Recording frequency	Methane content has been measured using a continuous gas analyzer. Data has been measured at least once per hour and recorded electronically. In normal operating conditions, data has been recorded every two minutes electronically and it will be kept during the crediting period and two years after. Data has been aggregated monthly.	
Calculation method (if applicable)	The value of the monitored value shown in this table is the result of the weighted average in which raw data in the same time interval accomplish the following three operational conditions at the same time: • Condition 1: The $LFG_{flare,y}$ should be between 150 and 1,500 Nm^3/h • Condition 2: The w_{CH4} should be between 25 and 75% in CH_4 • Condition 3:The T_{flare} should be between 500 and 1,200ºC.	
QA/QC procedures	Gas analyzer has been subject to a regular calibration, maintenance and testing regime to ensure accuracy. As per equipment provider, the FAU conducts a span gas check every 8 hours, even though the provider recommends only one check per week. The characteristics of the standard certified gas are as follows: -Bottle 1: 50% CH_4, 35% CO_2 y balance 15% (N_2). -Bottle 2: 4% O_2 y balance 96% (N_2).	

Purpose of data	Baseline
Additional comment	Paired values of the methane fraction of the landfill gas and LFG flow which are averaged for the same time interval have been used in the calculation of emission reductions. The meter has been installed in this first phase of the project activity in the main line between the flare and the booster (before LFGflare_Flowmeter). The project is operating under first phase (only flaring) during the 2nd Monitoring so this parameter is monitored.

Data / Parameter:	**$EL_{LFG,y}$**	
Unit	MWh	
Description	Net quantity of electricity generated using LFG	
Measured/Calculated /Default	When installed, it will be measured by an electricity meter	
Source of data	Not installed	
Value(s) of monitored parameter		Not installed
Monitoring equipment	Type	Not installed
	Accuracy class	Not installed
	Manufacturer	Not installed
	Model	Not installed
	Serial Number	Not installed
	Calibration Frequency	Not installed
	Date of last calibration	Not installed
	Validity of last calibration	Not installed
	Installation date	Not installed
	Validity of calibration runs from	Not installed
Measuring/Reading/ Recording frequency	Not installed	
Calculation method (if applicable)	Not installed	
QA/QC procedures	Not installed	
Purpose of data	Not used	
Additional comment	The meter will be installed once the project achieves its second phase of the project activity (LFG electricity generation).	

Data / Parameter:	Operation of the energy (electrical) plant	
Unit	Hours	
Description	Hours of operation of the electrical energy plant	
Measured/Calculated /Default	When installed, it will be measured by an run meter	
Source of data	N/A	
Value(s) of monitored parameter		Not installed
Monitoring equipment	Type	Not installed
	Accuracy class	Not installed
	Manufacturer	Not installed
	Model	Not installed
	Serial Number	Not installed
	Calibration Frequency	Not installed
	Date of last calibration	Not installed
	Validity of last calibration	Not installed
	Installation date	Not installed
	Validity of calibration runs from	Not installed
Measuring/Reading/ Recording frequency	Not installed	
Calculation method (if applicable)	Not installed	
QA/QC procedures	Not installed	
Purpose of data	Not used	
Additional comment	The meter will be installed once the project achieves its second phase of the project activity (LFG electricity generation).	

Data / Parameter:	Operation of the flare station	
Unit	Hours	
Description	Measurement with run meter connected to the blower	
Measured/Calculated /Default	Measured	
Source of data	Automatic Data Gathering System	
Value(s) of monitored parameter		9,071
Monitoring equipment	Type	Run Time Meter
	Accuracy class	±1 second
	Manufacturer	Landtec
	Model	LFG PRO
	Serial Number	N/A
	Calibration Frequency	N/A
	Date of last calibration	N/A
	Validity of last calibration	N/A
	Installation date	N/A
	Validity of calibration runs from	N/A
Measuring/Reading/ Recording frequency	Measured with run time meter. In normal operating conditions, data has been recorded every two minutes electronically and it will be kept during the crediting period and two years after. Data has been also been aggregated monthly.	

Calculation method (if applicable)	The value of the monitored value shown in this table is the result of the accumulated operational time of the flare in which raw data in the same time interval accomplish the following three operational conditions at the same time: • Condition 1: The $LFG_{flare,v}$ should be between 150 and 1,500 Nm^3/h • Condition 2: The w_{CH4} should be between 25 and 75% in CH_4 • Condition 3:The T_{flare} should be between 500 and 1,200ºC
QA/QC procedures	The run time meter connected to the database from Landtec does not need calibration according to manufacturer's specification. Only time of operation which is between predefined thresholds is accounted as time of operation of the flare.
Purpose of data	Not used
Additional comment	The parameter is monitored to ensure methane destruction is claimed for methane destructed in the flare when it is operational. The parameter is measured with run meter connected to the database from Landtec which is, in turn, connected to the blower.

The following parameters are used to determine the project emissions from flaring of the residual gas stream (PEflare,y) and have been monitored as per the *"Tool to determine project emissions from flaring gases containing methane"*.

Data / Parameter:	**$PE_{flare,y}$**	
Unit	tCO_2e	
Description	Project emissions from flaring of the residual gas stream	
Measured/Calculated /Default	Calculated	
Source of data	Automatic Data Gathering System	
Value(s) of monitored parameter		873
Monitoring equipment	Type	Not used
	Accuracy class	Not used
	Manufacturer	Not used
	Model	Not used
	Serial Number	Not used
	Calibration Frequency	Not used
	Date of last calibration	Not used
	Validity of last calibration	Not used
	Installation date	Not used
	Validity of calibration runs from	Not used
Measuring/Reading/ Recording frequency	In normal operating conditions, data has been recorded every two minutes electronically and it will be kept during the crediting period and two years after. Data has also been aggregated monthly.	
Calculation method (if applicable)	The parameters used for the determination of $PE_{flare,v}$ are $LFG_{flare,v}$, w_{CH4}, fv_i, $fv_{CH4,FG}$, t_{O2} and T_{flare}. The calculation method is followed as per the "Tool to determine project emissions from flaring gases containing methane".	
QA/QC procedures	Regular maintenance will ensure optimal operation of the flare. Analyzers will be calibrated according to manufacturer's recommendations.	
Purpose of data	Project	

Additional comment	The parameters used for determining the project emissions from flaring of the residual gas stream ($PE_{flare,y}$) have been monitored as per the "Tool to determine project emissions from flaring gases containing methane". The project is operating under first phase (only flaring) during the 2nd Monitoring Period and that is why it is monitored. The parameters used for the determination of $PE_{flare,y}$ are $LFG_{flare,y}$, w_{CH4}, fv_i, $fv_{CH4,FG,}$ t_{O2} and T_{flare}.

Data / Parameter:	**$FV_{RG,h}$**	
Unit	Nm^3	
Description	Volumetric flow rate of the residual gas in dry basis at normal conditions in the hour h.	
Measured/Calculated /Default	Measured by a mass flow meter	
Source of data	Automatic Data Gathering System	
Value(s) of monitored parameter		2,980,583
Monitoring equipment	**Equipment 1**	
	Type	LFGflare_Flowmeter
	Accuracy class	± 1% Full Scale
	Manufacturer	Thermal Instruments
	Model	62-9/9500
	Serial Number	2010313
	Calibration Frequency	18 months
	Date of last calibration	24/08/2010
	Validity of last calibration	20/06/2012
	Installation date	21/12/2010
	Validity of calibration runs from	Installation date
	Equipment 2	
	Type	LFGflare_Flowmeter
	Accuracy class	± 1% Full Scale
	Manufacturer	Thermal Instruments
	Model	62-9/9500
	Serial Number	2008364
	Calibration Frequency	18 months
	Date of last calibration	07/10/2011
	Validity of last calibration	19/12/2013
	Installation date	20/06/2012
	Validity of calibration runs from	Installation date
Measuring/Reading/ Recording frequency	Continuous mass flow meters have been used to measure flow rates. In normal operating conditions, data has been recorded every two minutes electronically and it will be kept during the crediting period and two years after. Data has been also aggregated monthly.	

Calculation method (if applicable)	The value of the monitored value shown in this table is the result of the accumulated flow in which raw data in the same time interval accomplish the following three operational conditions at the same time: • Condition 1: The $LFG_{flare,v}$ should be between 150 and 1,500 Nm^3/h • Condition 2: The w_{CH4} should be between 25 and 75% in CH_4 • Condition 3:The T_{flare} should be between 500 and 1,200ºC
QA/QC procedures	Flow meters have been subject to regular maintenance and testing regime to ensure accuracy. The same basis (dry or wet) as CH_4 concentration is considered for this measurement when the residual gas temperature exceeds 60ºC.
Purpose of data	Project
Additional comment	As a simplified approach, this parameter is considered to be the same as the amount of landfill gas flared at normal temperature and pressure ($LFG_{flare,v}$) as per the "Tool to determine project emissions from flaring gases containing methane". No separate monitoring of temperature and pressure have been necessary because the project activity is using flow meters that automatically compensate for temperature and pressure, expressing LFG volumes in normalized cubic meters (Nm^3). The meter has been installed in this first phase of the project activity in the main line between the flare and the booster (after the Field Analyser Unit). The variable is monitored, as required by the "Tool to determine project emissions from flaring gases containing methane" to calculate the flare efficiency.

Data / Parameter:	**$fv_{i,h}$**	
Unit	-	
Description	Volumetric fraction of methane in the residual gas in the hour h	
Measured/Calculated /Default	Measured by a gas analyzer	
Source of data	Automatic Data Gathering System	
Value(s) of monitored parameter		43.4%
Monitoring equipment	**Equipment 1**	
	Type	Field Analyser Unit (FAU)
	Accuracy class	± 0.2% to ± 1% (0 to full scale)
	Manufacturer	Landtec
	Model	FAU
	Serial Number	GA08901
	Calibration Frequency	6 months
	Date of last calibration	29/11/2011
	Validity of last calibration	16/09/2013
	Installation date	17/03/2013
	Validity of calibration runs from	Installation date
	Equipment 2	
	Type	Field Analyser Unit (FAU)
	Accuracy class	± 0.2% to ± 1% (0 to full scale)
	Manufacturer	Landtec
	Model	FAU
	Serial Number	GA08754

	Calibration Frequency	6 months
	Date of last calibration	10/02/2011
	Validity of last calibration	16/01/2013
	Installation date	17/07/2012
	Validity of calibration runs from	Installation date
Measuring/Reading/ Recording frequency	Methane content has been measured using a continuous gas analyzer. Data has been measured at least once per hour and recorded electronically. In normal operating conditions, data has been recorded every two minutes electronically and it will be kept during the crediting period and two years after.. Data has been aggregated monthly.	
Calculation method (if applicable)	The value of the monitored value shown in this table is the result of the weighted average in which raw data in the same time interval accomplish the following three operational conditions at the same time: • Condition 1: The $LFG_{flare,v}$ should be between 150 and 1,500 Nm^3/h • Condition 2: The w_{CH4} should be between 25 and 75% in CH_4 • Condition 3:The T_{flare} should be between 500 and 1,200ºC	
QA/QC procedures	As a simplified approach, only methane content of the residual gas will be measured and the remaining part will be considered as N2. Gas analyzer has been subject to a regular calibration, maintenance and testing regime to ensure accuracy. The same basis (dry or wet) is considered for this measurement when the residual gas temperature exceeds 60ºC. As per equipment provider, the FAU conducts a span gas check every 8 hours, even though the provider recommends only one check per week. The characteristics of the standard certified gas are as follows: -Bottle 1: 50% CH_4, 35% CO_2 y balance 15% (N_2). -Bottle 2: 4% O_2 y balance 96% (N_2).	
Purpose of data	Project	
Additional comment	This parameter is considered to be the same as the methane fraction in the landfill gas (wCH_4) as per the “Tool to determine project emissions from flaring gases containing methane”. As a simplified approach, only methane content of the residual gas has been measured and the remaining part has been considered as N_2. The meter has been installed in this first phase of the project activity in the main line between the flare and the booster (before LFGflare_Flowmeter). The variable is monitored, as required by the “Tool to determine project emissions from flaring gases containing methane” to calculate the flare efficiency.	

Data / Parameter:	$t_{O2,h}$	
Unit	-	
Description	Volumetric fraction of O_2 in the exhaust gas of the flare in the hour h	
Measured/Calculated /Default	On-site measurements using a continuous gas analyser.	
Source of data	Automatic Data Gathering System	
Value(s) of monitored parameter		14.9%
Measuring/Reading/ Recording frequency	Type	Flare Emissions Analyser (FEA)
	Accuracy class	O_2 = 0.1% + 1% of reading
	Manufacturer	Landtec
	Model	FEA
	Serial Number	4300
	Calibration Frequency	12 months
	Date of last calibration	04/11/2011
	Validity of last calibration	03/11/2012
	Date of previous calibration	09/12/2010
	Validity of previous calibration	08/12/2011
	Installation date	21/01/2010
	Validity of calibration runs from	Calibration Date
	Oxygen concentration in the exhaust gas has been measured at least once per hour using a continuous gas analyser, and data records will be kept during the crediting period and two years after. Data has also been aggregated daily/monthly/yearly.	
Calculation method (if applicable)	The value of the monitored value shown in this table is the result of the weighted average in which raw data in the same time interval accomplish the following three operational conditions at the same time: • Condition 1: The $LFG_{flare,v}$ should be between 150 and 1,500 Nm^3/h • Condition 2: The w_{CH4} should be between 25 and 75% in CH_4 • Condition 3:The T_{flare} should be between 500 and 1,200ºC	
QA/QC procedures	Analyser has been periodically calibrated according to the manufacturer's recommendation. A zero check and typical value check by comparison with a standard certified gas has been conducted. The FEA is calibrated manually by the Field Technician at least one time per week. The characteristics of the standard certified gas are as follows: -Bottle 1: 400 ppm CH_4, 15% O_2 and balance ≈85% (N_2). -Bottle 2: 100% N_2.	
Purpose of data	Project	
Additional comment	Extractive sampling analysers with water and particulates removal devices have been used. The point of measurement (sampling point) is in the upper section of the flare (80% of total flare height). Sampling is conducted with appropriate sampling probes adequate to high temperatures level (e.g. inconel probes). The variable is monitored, as required by the "Tool to determine project emissions from flaring gases containing methane" to calculate the flare efficiency.	

Data / Parameter:	**$fv_{CH4,FG,h}$**	
Unit	mg/m^3	
Description	Concentration of methane in the exhaust gas of the flare in dry basis at normal conditions	
Measured/Calculated /Default	On-site measurements using a continuous gas analyser.	
Source of data	Automatic Data Gathering System	
Value(s) of monitored parameter		11.48
Monitoring equipment	Type	Flare Emissions Analyser (FEA)
	Accuracy class	CH_4 = 5ppm +1% of reading
	Manufacturer	Landtec
	Model	FEA
	Serial Number	4300
	Calibration Frequency	12 months
	Date of last calibration	04/11/2011
	Validity of last calibration	03/11/2012
	Date of previous calibration	09/12/2010
	Validity of previous calibration	08/12/2011
	Installation date	21/01/2010
	Validity of calibration runs from	Calibration Date
Measuring/Reading/ Recording frequency	Methane concentration in the exhaust gas has been measured at least once per hour using a continuous gas analyser, and data records will be kept during the crediting period and two years after. Data has also been aggregated daily/monthly/yearly.	
Calculation method (if applicable)	The value of the monitored value shown in this table is the result of the weighted average in which raw data in the same time interval accomplish the following three operational conditions at the same time: • Condition 1: The $LFG_{flare,v}$ should be between 150 and 1,500 Nm^3/h • Condition 2: The w_{CH4} should be between 25 and 75% in CH_4 • Condition 3:The T_{flare} should be between 500 and 1,200ºC	
QA/QC procedures	Analyser has been periodically calibrated according to the manufacturer's recommendation. A zero check and typical value check by comparison with a standard certified gas has been conducted. The FEA is calibrated manually by the Field Technician at least one time per week. The characteristics of the standard certified gas are as follows: -Bottle 1: 400 ppm CH_4, 15% O_2 and balance ≈85% (N_2). -Bottle 2: 100% N_2.	
Purpose of data	Project	
Additional comment	Extractive sampling analysers with water and particulates removal devices have been used. The point of measurement (sampling point) is in the upper section of the flare (80% of total flare height). Sampling is conducted with appropriate sampling probes adequate to high temperatures level (e.g. inconel probes). To convert from ppmv to mg/m^3, the monitored values have been multiplied by 0.716 as per the page 13 of the "Tool to determine project emissions from flaring gases containing methane" (Annex 13, EB 28). The variable is monitored, as required by the "Tool to determine project emissions from flaring gases containing methane" to calculate the flare efficiency.	

Data / Parameter:	**T_{flare}**	
Unit	ºC	
Description	Temperature in the exhaust gas of the flare.	
Measured/Calculated /Default	On-site measurements using a thermocouple.	
Source of data	Automatic Data Gathering System	
Value(s) of monitored parameter		769.22
Monitoring equipment	**Equipment 1**	
	Type	Thermocouple
	Accuracy class	± 2.2° C or 0.75% of reading, whichever is greater
	Manufacturer	Thermo Sensors Corporation
	Model	K
	Serial Number	127491-1,2,3,4
	Calibration Frequency	18 months
	Date of last calibration	07/06/2012
	Validity of last calibration	13/05/2014
	Installation date	14/11/2012
	Validity of calibration runs from	Installation date
	Equipment 2	
	Type	Thermocouple
	Accuracy class	± 2.2° C or 0.75% of reading, whichever is greater
	Manufacturer	Thermo Sensors Corporation
	Model	K
	Serial Number	123781-3,5,6,10
	Calibration Frequency	18 months
	Date of last calibration	23/12/2010
	Validity of last calibration	26/10/2012
	Installation date	27/04/2011
	Validity of calibration runs from	Installation date
Measuring/Reading/ Recording frequency	Temperature in the exhaust gas has been measured at least once per hour using four thermocouples distributed along the flare stack. Data records will be kept during the crediting period and two years after. Data has also been aggregated daily/monthly/yearly.	
Calculation method (if applicable)	The value of the monitored value shown in this table is the result of the weighted average in which raw data in the same time interval accomplish the following three operational conditions at the same time: • Condition 1: The $LFG_{flare,y}$ should be between 150 and 1,500 Nm^3/h • Condition 2: The w_{CH4} should be between 25 and 75% in CH_4 • Condition 3:The T_{flare} should be between 500 and 1,200ºC	
QA/QC procedures	Continuous measurement of the temperature of the exhaust gas stream in the flare by a thermocouple. A temperature above 500 ºC indicates that a significant amount of gases are still being burnt and that the flare is operating.	
Purpose of data	Not used directly in the calculations	

Additional comment	An excessively high temperature at the sampling point may be an indication that the flare is not being adequately operated or that its capacity is not adequate to the actual flow. The parameter T_{flare} is measured with four measurements (sampling points), distributed along the flare stack.

The following variables are required to determine the electricity consumption from the grid using the *"Tool to calculate baseline, project and/or leakage emissions from electricity consumption"*, version 1.

Data / Parameter:	**$PE_{EC,y}$**
Unit	tCO_2
Description	Project emissions from electricity consumption by the project activity
Measured/Calculated /Default	Calculated as per the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (Version 1)
Source of data	Manual Data Gathering System
Value(s) of monitored parameter	29
Measuring/Reading/ Recording frequency	Calculated from on-site consumption of electricity, which is measured continuously with electricity meter and aggregated monthly in invoices provided by the grid operator.
Calculation method (if applicable)	As per the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (Version 1)
QA/QC procedures	As per the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (Version 1)
Purpose of data	Project.
Additional comment	Project electricity consumption is the sum of electricity consumption by the LFG blower and the monitoring equipment (incl. office). Each component has the same emissions factor for electricity generation and the same transmission and distribution losses.

Data / Parameter:	**$EC_{PJ,y}$**	
Unit	MWh	
Description	On-site consumption of electricity provided by the grid and/or LFG-based power plant(s) attributable to the project activity	
Measured/Calculated /Default	On-site measurements	
Source of data	Manual Data Gathering System	
Value(s) of monitored parameter	45	
Monitoring equipment	Type	Electricity Meter
	Accuracy class	±0.2%
	Manufacturer	Elster
	Model	FM 9S (8S)
	Serial Number	75P2X2
	Calibration Frequency	24 months
	Date of last calibration	23/01/2011

	Validity of last calibration	23/01/2013
	Installation date	10/02/2010
	Validity of calibration runs from	No calibration expiration
Measuring/Reading/ Recording frequency	Measured continuously with electricity meter, aggregated monthly in invoices provided by the grid operator.	
Calculation method (if applicable)	Monthly invoices are aggregated and compared against accumulated electricity readings from electricity meter.	
QA/QC procedures	According to manufacturer's specifications, the electricity meters do not need to be calibrated. Monthly invoices are aggregated and cross-checked against accumulated electricity readings from electricity meter to ensure reliability of data.	
Purpose of data	Project	
Additional comment	Project electricity consumption is mainly due to the electricity consumption by the LFG blower and the monitoring equipment (incl. office) and is monitored as per the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (Version 1). The meter has been installed in this first phase of the project activity outside the compound in order to be accessible by the electricity company (CFE). The Serial Number used by the manufacturer is 11040145, which has been reassigned by CFE as serial number 75P2X2. Since the direct provider of the electricity meter to the PP is CFE, the serial number 75P2X2 is used.	

Data / Parameter:	**TDL_y**
Unit	-
Description	Average technical transmission and distribution losses in the grid for the voltage level at which electricity is obtained from the grid.
Measured/Calculated /Default	A default value of 20%.
Source of data	As per "Tool to calculate project, baseline and leakage emissions from electricity consumption" (version 1)
Value(s) of monitored parameter	20%
Measuring/Reading/ Recording frequency	Default value of average technical transmission and distribution losses is used so it is Measuring/ Reading/ Recording frequency are not relevant for its accuracy.
Calculation method (if applicable)	No calculation method is used.
QA/QC procedures	In the absence of data from the relevant year, most recent figures should be used, but not older than 5 years.
Purpose of data	Project
Additional comment	Project electricity consumption is mainly due to the electricity consumption by the LFG blower and the monitoring equipment (incl. office). Each component has the same emissions factor for electricity generation and the same transmission and distribution losses.

The following variables are required to determine the CO_2 emissions from fossil fuel combustion using the "*Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion".*

Data / Parameter:	$PE_{FC,j,y}$
Unit	tCO_2e
Description	Project emissions from fossil fuel combustion in process j (LPG) during the year y
Measured/Calculated /Default	Calculated as per the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion"
Source of data	Manual Data Gathering System
Value(s) of monitored parameter	1
Measuring/Reading/ Recording frequency	Calculated from on-site consumption of LPG fuel, which is measured periodically with a Liquid-Level Gauge and aggregated monthly in invoices provided by the fuel provider.
Calculation method (if applicable)	Calculated as per the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion"
QA/QC procedures	Not applicable
Purpose of data	Project
Additional comment	Any eventual fossil fuel consumption during project activity will be accounted for with purchase receipts or invoices. For the 2nd Monitoring Period, LPG and Diesel have been used.

Data / Parameter:	$PE_{FC,j,y}$
Unit	tCO_2e
Description	Project emissions from fossil fuel combustion in process j (Diesel) during the year y
Measured/Calculated /Default	Calculated as per the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion"
Source of data	Manual Data Gathering System
Value(s) of monitored parameter	0
Measuring/Reading/ Recording frequency	Calculated from on-site consumption of Diesel, which is measured periodically with a Liquid-Level Gauge and aggregated monthly in invoices provided by the fuel provider.
Calculation method (if applicable)	Calculated as per the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion"
QA/QC procedures	Not applicable
Purpose of data	Project
Additional comment	Any eventual fossil fuel consumption during project activity will be accounted for with purchase receipts or invoices. For the 2nd Monitoring Period, LPG and Diesel have been used.

Data / Parameter:	$FC_{i,i,y}$	
Unit	m^3	
Description	Quantity of fuel type i combusted in process j during the year y (LPG)	
Measured/Calculated /Default	Onsite measurements	
Source of data	Manual Data Gathering System	
Value(s) of monitored parameter	0.3124	
Monitoring equipment	Type	Liquid-Level Gauge
	Accuracy class	±5%
	Manufacturer	Rochester Gauges, Inc
	Model	6281

	Serial Number	4-1693
	Calibration Frequency	NA
	Date of last calibration	NA
	Validity of last calibration	NA
	Installation date	NA
	Validity of calibration runs from	NA
Measuring/Reading/ Recording frequency	Measured continuously with a volume meter. Since fuel (LPG) is supplied from small daily tanks, a ruler is used to determine the volume of the fuel consumed. The ruler gauge is part of the daily tank and the control for recording the measurements is done in daily logsheets.	
Calculation method (if applicable)	The consumed value in a daily basis is determined by the difference of two consecutive Liquid-Level Gauge readings (%) and multiplied by the storage tank capacity.	
QA/QC procedures	The consistency of metered fuel consumption quantities has been crosschecked by an energy balance that is based on purchased quantities and stock changes. Since the purchased fuel invoices can be identified specifically for the CDM project, the metered fuel consumption quantities have also been crosschecked with available purchase invoices from the financial records as per the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion". As per manufacturer´s specification, the Liquid-Level Gauge does not require a calibration.	
Purpose of data	Project	
Additional comment	The data used to account for the project emissions are sourced from the purchase invoices. The parameter $FC_{i,j,y}$ is measured by the Liquid Level Gauge. Since fuel (LPG) is supplied from small daily tanks, this measurement method have been used to determine the volume of the fuel consumed as per the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" in its Version 2. The ruler gauge is part of the tank, installed inside the compound.	

Data / Parameter:	**$FC_{i,j,y}$**	
Unit	m^3	
Description	Quantity of fuel type i combusted in process j during the year y (Diesel)	
Measured/Calculated /Default	Onsite measurements	
Source of data	Manual Data Gathering System	
Value(s) of monitored parameter		0
Monitoring equipment	Type	Liquid-Level Gauge
	Accuracy class	±5%
	Manufacturer	NA
	Model	NA
	Serial Number	NA
	Calibration Frequency	NA
	Date of last calibration	NA
	Validity of last calibration	NA
	Installation date	NA
	Validity of calibration runs from	NA
Measuring/Reading/ Recording frequency	Measured continuously with a volume meter. Since fuel (Diesel) is supplied from small daily tanks, a ruler is used to determine the volume of the fuel consumed. The ruler gauge is part of the daily tank and the control for recording the measurements is done in daily logsheets.	

Calculation method (if applicable)	The consumed value of diesel during the project activity will be accounted for with purchase invoices.
QA/QC procedures	The consistency of metered fuel consumption quantities has been crosschecked by an energy balance that is based on purchased quantities and stock changes. Since the purchased fuel invoices can be identified specifically for the CDM project, the metered fuel consumption quantities have also been crosschecked with available purchase invoices from the financial records as per the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion". As per manufacturer´s specification, the Liquid-Level Gauge does not require a calibration.
Purpose of data	Project
Additional comment	The data used to account for the project emissions are sourced from the purchase invoices. The parameter $FC_{i,i,y}$ is measured by the Liquid Level Gauge. Since fuel (LPG) is supplied from small daily tanks, this measurement method have been used to determine the volume of the fuel consumed as per the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" in its Version 2. The ruler gauge is part of the tank, installed inside the compound.

The following variables have been provided by third parties and no equipment has been used for its measurement:

Data / Parameter:	**$NCV_{i,y}$**
Unit	GJ/m^3
Description	Weighted average net calorific value of fuel type i (LPG)
Measured/Calculated /Default	Default
Source of data	Value of LPG provided by the fuel supplier
Value(s) of monitored parameter	27.3
Monitoring equipment	Not necessary since it is a default value
Measuring/Reading/ Recording frequency	Not applicable since it is a default value
Calculation method (if applicable)	Not applicable since it is a default value
QA/QC procedures	Not applicable
Purpose of data	Project
Additional comment	Mixture of LPG at 70% Propane and 30% Butane is used to start-up the flare. The net calorific value of LPG has been provided by the fuel supplier as per the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion".

Data / Parameter:	**$NCV_{i,y}$**
Unit	GJ/m^3
Description	Weighted average net calorific value of fuel type i (Diesel)
Measured/Calculated /Default	Default
Source of data	IPCC default values for diesel at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories.
Value(s) of monitored parameter	43.3
Monitoring equipment	Not necessary since it is a default value
Measuring/Reading/ Recording frequency	Not applicable since it is a default value
Calculation method (if applicable)	Not applicable since it is a default value

QA/QC procedures	Not applicable
Purpose of data	Project
Additional comment	Diesel generator is used as a back-up when there is a power outage. The net calorific value of Diesel has been taken from the IPCC default values as per the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion".

Data / Parameter:	**$EF_{CO2,i,y}$**
Unit	tCO_2/GJ
Description	Weighted average CO_2 emission factor of fuel type i in year y (LPG)
Measured/Calculated /Default	Default
Source of data	IPCC default values as provided in Table 1.4 of Chapter 1 Vol. 2 (energy) of the 2006 IPCC Guidelines on National GHG Inventories.
Value(s) of monitored parameter	0.0656
Monitoring equipment	Not necessary since it is a default value
Measuring/Reading/ Recording frequency	Not applicable since it is a default value
Calculation method (if applicable)	Not applicable since it is a default value
QA/QC procedures	Not applicable
Purpose of data	Project
Additional comment	The CO_2 emission factor of LPG has been taken from IPCC default values as per the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion"

Data / Parameter:	**$EF_{CO2,i,y}$**
Unit	tCO_2/GJ
Description	Weighted average CO_2 emission factor of fuel type i in year y (Diesel)
Measured/Calculated /Default	Default
Source of data	IPCC default values as provided in Table 1.4 of Chapter 1 Vol. 2 (energy) of the 2006 IPCC Guidelines on National GHG Inventories.
Value(s) of monitored parameter	0.0748
Monitoring equipment	Not necessary since it is a default value
Measuring/Reading/ Recording frequency	Not applicable since it is a default value
Calculation method (if applicable)	Not applicable since it is a default value
QA/QC procedures	Not applicable
Purpose of data	Project
Additional comment	The CO_2 emission factor of Diesel has been taken from IPCC default values as per the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion"

D.3. Implementation of sampling plan

Not applicable. The section is left blank intentionally.

SECTION E. Calculation of emission reductions or GHG removals by sinks

The raw data gathered is presented in Monthly ER Spreadsheets to calculate the Emission Reductions (ERy) in a monthly basis as per the applicable methodologies and the registered PDD and these are aggregated and reported in the Summary ER Spreadsheet to be presented in conjunction with the CDM-MR.

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

The following table summarizes the actual values used to calculate the baseline emissions (BE_y) with the corresponding results applying the formulae as per the registered PDD:

Table 5 Results and parameters to calculate the Baseline Emissions of the Culiacan Landfill Project.

Data / Parameter:	Description	Source	Total Value	Unit
BE	Baseline Emissions			
BE = (MDproject-MD_{BL}) * GWPCH4 + ELLFG * CEFelec,BL + ETLFG * CEFther,BL		Eq. (1)	**18,418**	tCO2e
MDproject	Amount of methane that would have been destroyed			
MDproject = MDflared + MDelectricity + MDthermal + MDPL		Eq (3)	**877**	tCH4
MDflared	Methane destroyed by flaring			
MDflared = (LFGflare * wCH4 * D CH4) - (PEflare / GWPCH4)		Eq (4)	**877**	tCH4
LFGflare	Quantity of landfill gas fed to the flare	Monitored	**2,980,583**	m3 LFG
wCH4	Average methane fraction of the landfill gas	Monitored	**43.4%**	m^3CH4/m^3LFG
DCH4	Methane density at normal temperature and pressure	Default	**0.0007168**	tCH4/m3CH4
PEflare	Project emissions from flaring of the residual gas stream			
PEflare = TMRG * (1 - ηflare) * GWPCH4 / 1000		Step 7. Eq (T.15)	**873**	tCO2e
TMRG	Total mass flow rate in the residual gas	Step 5. Eq (T.13)	**917,634**	kg
ηflare	Flare combustion efficiency	Step 6. Eq (T.14)	**95.5%**	
GWPCH4	Global Warming Potential value for methane	Default	**21**	tCO2e/tCH4
MD_{BL}	Methane that would have been destroyed due to regulatory requirement			
MDBL= MDproject * AF		Eq (2)	**-**	tCH4
AF	Adjustment factor (for methane destruction in the baseline) (%)	Default	**-**	m3 LFG

As shown in the Table 5 and according to ACM0001 (version 11), the greenhouse gas baseline emissions (BE_y) during the monitoring period are given by the Equation (1), once the required simplifications have been adopted (i.e EL_{LFG}=0 and ET_{LFG}=0). The methane destroyed by the project activity ($MD_{project}$) during the monitoring period is determined by monitoring the quantity of methane flared and gas used to generate electricity and/or produce thermal energy and the total quantity of methane captured applying Equation (3), applying the required simplifications (i.e $MD_{electricity}$=0, $MD_{thermal}$=0) because there is no generation of electricity neither utilization for thermal purposes during the monitoring period.

The calculation of MD_{flared} is conducted applying the Equation (4) where the methane sent to the flare is determined by monitoring LFG_{flare} and w_{CH4} every 2 minutes (under normal operational conditions) with paired values added over the monitoring period. In the Table 5 above, the values of LFG_{flare} and w_{CH4} are cumulative and average values, respectively. The calculation of PE_{flare} in Equation (T.15) is conducted as per the seven steps described in the "Tool to determine project emissions from flaring gases containing methane" (ver. 1) using continuous monitoring of the methane destruction efficiency of the flare (flare efficiency) as shown in the ER Calculation Spreadsheets (see Monthly ER Spreadsheets).

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

The following table summarizes the actual values used to calculate the project emissions (PE) with the corresponding results applying the formulae as per the registered PDD:

Table 6 Results and parameters used to calculate the Project Emissions of the Culiacan Landfill Project.

Data / Parameter:	Description	Source	Total Value	Unit
PE	Project Emissions			
PE = PEEC + PEFC,j		Eq. (8)	**30**	tCO2
PEEC	Emissions from consumption of electricity in the project case			
PEEC = ECPJ * EFgrid * (1 + TDL)		Eq. (9)	**29**	tCO2
ECPJ	Quantity of electricity consumed by the project activity	Monitored	**45**	MWh
EFgrid	Emission factor for the grid	Default	**0.538**	tCO2/MWh
TDL	Average technical transmissions and distribution losses	Default	**20.0%**	%
PEFC,j	Project emissions from fossil fuel combustion in process j (tCO2)			
PEFC,j = FCi,j* COEFi (LPG)		Eq. (10)	**1**	tCO2
PEFC,j = FCi,j* COEFi (Diesel)		Eq. (10)	**-**	tCO2
FCi,j	Quantity of fuel type i combusted in process j (LPG)	Monitored	**0.3124**	m3
FCi,j	Quantity of fuel type i combusted in process j (Diesel)	Monitored	**-**	m3
COEFi	CO2 emission coefficient of fuel type i (LPG)			
COEFi = NCVi *EF CO2,i		Eq. (TF.4)	**1.791**	tCO2/TJ
NCVi	Weighted average net calorific value of the fuel type i (LPG)	Provider	**27.30**	GJ/m3
EF CO2,i	Weighted average CO2 emission factor of fuel type (LPG)	IPCC	**0.0656**	tCO2/GJ
COEFi	CO2 emission coefficient of fuel type i (Diesel)			
COEFi = NCVi *EF CO2,i		Eq. (TF.4)	**3.239**	tCO2/TJ
NCVi	Weighted average net calorific value of the fuel type i (Diesel)	Provider	**43.30**	GJ/m3
EF CO2,i	Weighted average CO2 emission factor of fuel type (Diesel)	IPCC	**0.0748**	tCO2/GJ

As shown in the Table 6 and according to ACM0001 (version 11), the greenhouse gas project emissions (PE_y) during the monitoring period are given by the Equation (8). The values for $PE_{EC,y}$ and $PE_{FC,i,y}$ in Equation (8) are calculated as follows:

- The project emissions from consumption of electricity ($PE_{EC,y}$) have been calculated using the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" (TE) applying Equation (9) using the monitored value of the quantity of electricity consumed by the project activity, a fixed value of the emission factor (EF_{grid}) and an average technical transmission and destruction losses (TDL).
- The project emissions from the fossil consumption ($PE_{FC,i}$) have been calculated according to the version 2 of the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion" (TF) and is given by the Equation (TF.4), using the monitored value of the quantity of fuel LPG and Diesel consumed by the project activity ($FC_{i,i}$) and the CO_2 emission coefficient of the LPG and Diesel ($COEF_{i,}$) calculated as per the Equation (TF.4).

E.3. Calculation of leakage

The calculation does not need to consider leakage emissions, so LE_y=0.

E.4. Summary of calculation of emission reductions or net anthropogenic GHG removals by sinks

The following table summarizes the actual values used to calculate the emission reductions (ER_y) with the corresponding results applying the Equation (11) as per the registered PDD:

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 reductions or net anthropogenic GHG removals by sinks ($t CO_2e$)
Total	18,418	30	0	**18,388**

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

The following table shows a comparison of actual values of the emission reductions achieved during the monitoring period with the estimations in the registered CDM-PDD. Since the monitoring period is considered from 01/08/2012 to 31/12/2013 (both days included), it comprises 153 days of 2012 and 365 days of 2013 hence relative values (tCO2e/day) for each year have been compared against relative values presented in the CDM-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 ($t CO_2e$)	67,849	18,388

The values in the ex-ante calculation of the registered CDM-PDD are 49,373 tCO2e for 2012 (366 days) and 46,541 tCO2e for 2013 (365 days). The average for both years equate to 131 tCO2e/day, which once multiplied by 518 days of the current monitored period, equates to 67,964 tCO2e. In order to compare the actual emission reductions with the estimated values in the registered CDM-PDD in the same period, the actual relative emission reductions achieved during the current monitoring period (35 tCO2e/day) are lower than the relative emission reductions stated in the registered CDM-PDD (131 tCO2e/day). Considering the same time basis and the same periods, the actual emission reductions achieved during the current monitoring period (18,388 tCO2e) are lower than the emission reductions derived from the yearly values stated in the registered CDM-PDD (67,964 tCO2e).

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

The actual emission reductions achieved during the current monitoring period (18,593 tCO_2e) are lower than the emission reductions derived from the yearly values stated in the registered CDM-PDD (55,264 tCO_2e). Therefore, there is no need to provide explanation of any increase.

E.7. Actual emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

Item	Actual values achieved up to 31 December 2012	Actual values achieved from 1 January 2013 onwards
Emission reductions or GHG removals by sinks ($t CO_2e$)	6,778	11,610

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Document information

Version	*Date*	*Description*
03.2	5 November 2013	Editorial revision to correct table in page 1.
03.1	2 January 2013	Editorial revision to correct table in section E.5.
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net anthropogenic GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
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