



Verification and certification report form for CDM project activities

(Version 01.0)

Complete this form in accordance with the "Attachment: Instructions for filling out the verification and certification report form for CDM project activities" at the end of this form.

VERIFICATION AND CERTIFICATION REPORT

Title of the project activity	Exploitation of the biogas from controlled landfill in solid waste management central – CTRS / BR.040
Reference number of the project activity	UNFCCC ID: 3464 TN P-No. : 12986 – 16/085
Version number of the verification and certification report	1.0
Completion date of the verification and certification report	31/07/2017
Monitoring period number and duration of this monitoring period	MP 2 01/10/2011 – 31/12/2015 (both days included)
Version number of monitoring report to which this report applies	3
Crediting period of the project activity corresponding to this monitoring period	Type: Fixed Start date: 04/06/2011 Length: 10 years
Project participant(s)	Consórcio Horizonte Asja Asja Brasil Serviços para o Meio Ambiente Ltda.
Host Party	Brazil
Sectoral scope(s), selected methodology(ies), and where applicable, selected standardized baseline(s)	Scope: 13 / Technical Area: 13.1 CDM Methodology: ACM0001 ver. 11 - Consolidated baseline and monitoring methodology for landfill gas project activities
Estimated GHG emission reductions or net anthropogenic GHG removals for this monitoring period in the registered PDD	618,892 t CO _{2e}
Certified GHG emission reductions or net anthropogenic GHG removals for this monitoring period	609,566 t CO _{2e}
Name of DOE	TÜV NORD CERT GmbH
Name, position and signature of the approver of the verification and certification report	

	Stefan Winter Final Approver
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SECTION A. Executive summary

Consórcio Horizonte Asja has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 2nd periodic verification of the project:

“Exploitation of the biogas from controlled landfill in solid waste management central – CTRS / BR.040”

with regard to the relevant requirements for CDM project activities.

This verification covers the period from 01/10/2011 to 31/12/2015 (including both days).

The project reduces GHG emissions due to generation of electricity by combusting the landfill gas and to capture and flaring of landfill gas.

Details of the project location are given in table A-1 below:

Table A-1: Project Location

No.	Project Location
Host Country	Brazil
Region:	State of Minas Gerais, Municipality of Belo Horizonte
Project location address:	Highway BR.040, section Belo Horizonte – Sete Lagoas, near km 531, Jardim Filadélfia neighbourhood in Belo Horizonte city, Minas Gerais state, Brazil
Latitude:	19.9159 S
Longitude:	44.0181 W

Basic technical details of the project are summarized in table A-2.

Table - A-2: Technical data of the project activity

Flare

Parameter	Unit	Value/ Description
Quantity	01	enclosed flare with burning controlled system
Manufacturer		Biotecnogas
Biogas composition	%CH ₄ (range)	45/55
	% CO ₂ , gas and inert gas (Avg)	40
Biogas flow rate (flare capacity)	Nm ³ /h	From 500 (min) to 2,500 (max)

Flow Meter

Parameter	Unit	Value
Quantity	Unities	3
Serial #s		78147 (LFG _{total}) 78149 (LFG _{flare}) 78151 (LFG _{electricity})
Type		Annubar 285
Manufacturer		Rosemount

Parameter	Unit	Value
Accuracy	%	+/- 0.25

Landfill Gas Analyser

Parameter	Unit	Value
Quantity	Unities	1
Serial #s		ULT 01 - N1 X 6-991
Manufacturer		Siemens
Type		Ultramat 23
Accuracy	%	CH4: +/- 1 O ₂ : +/- 0.5

Flare Emission Analyser (Ultramat 23)

Parameter	Unit	Value
Quantity	Unities	1
Serial #s		ULT 02 - N1 X 6-992
Manufacturer		Siemens
Type		Ultramat 23
Accuracy	%	CH4: +/- 1 O ₂ : +/- 0.5

Thermocouples

Parameter	Unit	Value
Quantity	Unities	3
Serial Number		0950.064353 0950.064307 1121.513793
Model		M1
Manufacturer		Ecil
Accuracy (total permissible error)	°C	+/-1.5°C or 0.25% of the temperature (the one which is greater)
Operational Range	°C	0-1600
Type		Thermocouple type S (more robust than the required by the applied tool)

Electricity Meter (for electricity imported and generated)

Parameter	Unit	Value
Quantity	Unities	2 (main and backup)
Serial #s		PT-0912A354-01 (main) PT-0912A361-01 (backup)
Manufacturer		Schneider
Accuracy	%	+/- 0.2
Type		ION 8600C

Blower

Parameter	Unit	Value
Quantity	Unities	2
Serial Number		09400001 / 101510069
Manufacturer		Continental Industrie
Model		400A04

Electricity Generator

Parameter	Unit	Value
Quantity	Unities	4 until 21/09/2012 and then 3 from this date on
Serial Number		JEN 3534 21-01 JEN 3534 22-01 JEN 3534 23-01 JEN 3534 24-01 (uninstalled on 21/09/2012)
Power	kW	1,426
Type		J 420 GSB81

As a result of this verification, the verifier confirms that:

- all operations of the project are implemented and installed as planned and described in the validated project design document.
- the monitoring plan is in accordance with the applied approved CDM methodology, i.e., ACM0001 ver. 11
- the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately.
- the monitoring system is in place and functional. The project has generated GHG emission reductions.

As the result of the 2nd periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Emission reductions: 609,566 t CO₂e

SECTION B. Verification team, technical reviewer and approver

B.1. Verification team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk review	On-site inspection	Interview(s)	Verification findings
1.	Team Leader	EI	Sebben	Marcelo	BRTUV	x	x	x	x
2.	Team Member	EI	Cruz	Sergio	BRTUV	x	x	x	x

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

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	EI	Lopes	Ricardo	BRTUV
2	Technical reviewer	IR	Winter	Stefan	TÜV NORD CERT
3	Final approver	IR	Winter	Stefan	TÜV NORD CERT

SECTION C. Application of materiality

C.1. Consideration of materiality in planning the verification

In order to ensure a complete, transparent and timely execution of the verification task the team leader has planned the complete sequence of events necessary to arrive at a substantiated final verification opinion.

Various tools have been established in order to ensure an effective verification planning.

Materiality Threshold

The verification is based on the materiality threshold identified in table C-1 below:

Table C-1: Applied Materiality Threshold

	Threshold	Related to
<input type="checkbox"/>	0.5 %	Emission reductions or removals for registered CDM project activities achieving a total emission reduction or removal equal to or more than 500,000 tonnes of carbon dioxide equivalent per year ¹ ;
<input type="checkbox"/>	1 %	Emission reductions or removals for registered CDM project activities achieving a total emission reduction or removal of between 300,000 and 500,000 tonnes of carbon dioxide equivalent per year;
<input checked="" type="checkbox"/>	2 %	Emission reductions or removals for registered large-scale CDM project activities achieving a total emission reduction or removal of 300,000 tonnes of carbon dioxide equivalent per year or less;
<input type="checkbox"/>	5 %	Emission reductions or removals for registered small-scale CDM project activities other than registered CDM project activities covered under next category below;
<input type="checkbox"/>	10 %	Emission reductions or removals for the type of registered CDM project activities referred to in decision 3/CMP.6, paragraph 38 (referred to as microscale project activities).

Strategic Analysis

At the beginning of the verification the verification team leader has assessed the nature, scale and complexity of the verification tasks by carrying out a strategic analysis of all activities relevant to the project activity. The team leader has collected and reviewed the information relevant to assess that the designated verification team is sufficiently competent to carry out the verification and to ensure that it is able to conduct the necessary risk analysis.

Risk analysis and detailed audit testing planning

For the identification and assessment of potential reporting risks and to determine the necessary detailed audit testing procedures for residual risk areas the following table is used.

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Raw data generation	Medium	- Missing data due to failure of measurement equipment	- Site – visit - Check of equipment - Check of technical data sheets

¹ A year refers to a period of 12 consecutive months.

			<ul style="list-style-type: none"> - Installation of measuring equipment - Dysfunction of installed equipment - Lack of training of operational personnel - Downtimes of equipment - Exchange of equipment - Insufficient accuracy - Change of technology - Accuracy of values supplied by Third Parties 	<ul style="list-style-type: none"> - Check of suppliers information / guarantees - Check of calibration records - Check of maintenance records - Counter-check of raw data - Check of CDM management system - Check of CDM related procedures - Application of CDM management system procedures - Check of trainings - Check of responsibilities - Check of QA/QC documentation / evidences of involved third parties
2.	Raw data collection and data aggregation	Medium	<ul style="list-style-type: none"> - Wrong data transfer from raw data to daily and monthly aggregated reporting forms - IT Systems - Spread sheet programming - Manual data transmission - Data protection Responsibilities 	<ul style="list-style-type: none"> - Check of data aggregation steps - Counter-calculation - Data integrity checks by means of graphical data analysis and calculation of specific performance figures - Check of management system certification (if applicable) - Check of data archiving system - Check of application of Management system procedures
3.	Other calculation parameters (i.e. emission factors, oxidation factors, coefficients, correction factors, etc.)	Low	<ul style="list-style-type: none"> - The values and data sources applied are defined in the PDD and monitoring plan Supporting documentation version updates 	<ul style="list-style-type: none"> - Update-check of regulatory framework - Countercheck of the applied MP in the MR against the methodology and the PDD
4.	Calculation Methods	Medium	<ul style="list-style-type: none"> - Applied formulae - Miscalculation - Mistakes in spread sheet calculation 	<ul style="list-style-type: none"> - Countercheck on the basis of own calculation. - Spread sheet walk-through - Plausibility checks
5.	Monitoring reporting	Medium	<ul style="list-style-type: none"> - Data transfer to the author of the monitoring report - Data transfer to the monitoring report - Unintended use of outdated versions 	<ul style="list-style-type: none"> - Counter check with evidences provided - Audit of procedure application
6.	Mistake of weighing of waste	Medium	<ul style="list-style-type: none"> - Calibration of the scale not in accordance with monitoring plan - Wrong placement of waste on scale 	<ul style="list-style-type: none"> - Check of equipment - Check of calibration records - Check of trainings - Check of responsibilities

			- Lack of training of operational personnel	
7.	<i>Intentional or unintentional omissions and misstatements in data transfer from CCEE reports (i.e. electricity generation and consumption reports) or hand written notes (i.e. quantity of waste disposed in landfill for check purposes) into digital Excel ER spread sheet</i>	<i>Medium</i>	<i>Ineffective quality control of data transfer due to unclear QA/QC procedure</i>	<i>- Counter check with evidences provided</i>

On the basis of the risk analysis the verification has been planned. A detailed audit/verification plan has been prepared and submitted to the project participant(s) in due time before the site visit.

C.2. Consideration of materiality in conducting the verification

Based on the verification planning the verification has been carried out. The concept of materiality has been considered. A breakdown of the chosen approaches is included in the following table.

<i>Parameter</i>	<i>Approach*</i>	<i>Errors* detected</i>	<i>Findings reference</i>	<i>Corrected</i>	<i>Remaining verification risk</i>
LFG_{total,y}	COM	<input checked="" type="checkbox"/>	CL 1	<input checked="" type="checkbox"/>	Not material
LFG_{flare,y}	COM	<input type="checkbox"/>		<input type="checkbox"/>	Not material
LFG_{electricity,y}	COM	<input checked="" type="checkbox"/>	CL 1 CL 4	<input checked="" type="checkbox"/>	Not material
W_{CH4,y}	COM	<input checked="" type="checkbox"/>	CL 3 CL 4	<input checked="" type="checkbox"/>	Not material
Operation of the energy plant in an year y	CDC	<input checked="" type="checkbox"/>	CL 6	<input checked="" type="checkbox"/>	Not material
EL_{LFG}	CDC	<input type="checkbox"/>		<input type="checkbox"/>	Not material
EL_{PR}	CDC	<input type="checkbox"/>		<input type="checkbox"/>	Not material
CE_{flec,BL,y}	CDC	<input checked="" type="checkbox"/>	CAR 1	<input checked="" type="checkbox"/>	Not material
PE_{EC,y}	CDC	<input type="checkbox"/>		<input type="checkbox"/>	Not material
TDL_{j,y}	CDC	<input type="checkbox"/>		<input type="checkbox"/>	Not material
EF_{grid,CM,y}	CDC	<input checked="" type="checkbox"/>	CAR 1	<input checked="" type="checkbox"/>	Not material
f_{v,i,h}	COM	<input type="checkbox"/>		<input type="checkbox"/>	Not material
t_{O2,h}	COM	<input type="checkbox"/>		<input type="checkbox"/>	Not material
f_{CH4,FG,h}	COM	<input type="checkbox"/>		<input type="checkbox"/>	Not material
T_{flare}	COM	<input type="checkbox"/>		<input type="checkbox"/>	Not material
PE_{flare,y}	COM	<input type="checkbox"/>		<input type="checkbox"/>	Not material
FV_{RG,h}	COM	<input type="checkbox"/>		<input type="checkbox"/>	Not material
Aggregate					Materiality threshold not exceeded

*) incl. omissions and misstatements

+) Verification Approaches:

CDC:	Complete data check of data including all data aggregation steps
NDC:	Non-complete data check – omissions not material
SPL:	Sampling approach (all data available)
ASP:	Acceptance Sampling
COM:	Data check at higher data aggregation levels and sampling at original data levels

The verification was basically carried out as per the verification plan. However, based on the actual situation on-site and the errors, omissions and misstatements identified during the verification minor deviations from the original plan occurred. However, due to the insignificance no major revision of the overall plan was required. Esp. there was no need for significant modification of the sampling approaches or for additional / less locations to be visited during the on-site.

SECTION D. Means of verification

D.1. Desk review

During the desk review all documents initially provided by the client and publicly available documents relevant for the verification were reviewed. The main documents are listed below:

- the last revision of the PDD including the monitoring plan^{/PDD/},
- the last revision of the validation report^{/VAL/},
- documentation of previous verifications^{/VER/}
- the monitoring report, including the claimed emission reductions for the project^{/MR/},
- the emission reduction calculation spreadsheet^{/XLS/}.

Other supporting documents, such as publicly available information on the UNFCCC website and background information were also reviewed.

D.2. On-site inspection

Duration of on-site inspection: 22/06/2016 to 23/06/2016				
No.	Activity performed on-site	Site location	Date	Team member
1.	<ul style="list-style-type: none"> - Walk through CTRS/BR.040 site (LFG collection and flaring system, control room, and location of the meters) - Interview with project operators, O&M personnel and plant Manager. - Preparation of the CDM Draft Verification Report (DVR). 	Belo Horizonte	22/06/2016	Marcelo Sebben Sergio Cruz
2	<ul style="list-style-type: none"> - Evidence assessment at office (including calibration certificates checking, applicable legislation, technical information) - Interview with HR regarding GS parameters - Conversation regarding proposed PRC 	Belo Horizonte	23/06/2016	Marcelo Sebben
3	- ER and PE calculation review	Belo Horizonte	23/06/2016	Sergio Cruz

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Uchida	Melina	Asja Brasil	22/06/2016	ER calculations	Marcelo Sebben
2	Uchida	Melina	Asja Brasil	22/06/2016	Raw data, LFG System, Meters, MR, Technical specification	Marcelo Sebben
3	Hayashibara	Arnaldo	Consórcio Horizonte Asja	22/06/2016	Electricity generation, Calibration of equipment	Sergio Cruz
4	Silva	Odilon	Community representative next to Landfill	22/06/2016	Impact of PA in surroundings	Marcelo Sebben Sergio Cruz
5	Uchida	Melina	Asja Brasil	23/06/2016	Proposed PRC	Marcelo Sebben Sergio Cruz
6	Magalhães	Clarissa	Asja Brasil	23/06/2016	Health and Safety	Sergio Cruz
7	Pardócimo	Elaine	Asja Brasil	23/06/2016	Human Resources	Marcelo Sebben

D.4. Sampling approach**D.4.1 Sampling during monitoring**

<input checked="" type="checkbox"/>	No sampling approach has been used by the PP to determine the monitored parameters				
<input type="checkbox"/>	A sampling approach has been taken for the following monitored parameter(s):				
	Parameter	Sampling approach ¹⁾	Sampling Type ²⁾	Population	Sample Size

¹⁾ Sampling Approaches:

SiRS: Simple Random Sampling
 StRS: Stratified Random Sampling
 SS: Systematic Sampling
 CS: Cluster Sampling
 MSS: Multi-stage Sampling

²⁾ Sampling Types:

PS: Parameter Sampling

D.4.2 Sampling approaches during verification

<input type="checkbox"/>	No sampling approach has been used by the VT to verify the monitored parameters
<input checked="" type="checkbox"/>	A sampling approach has been applied by the VT for the following monitored parameter(s):

Parameter	Sampling approach ¹⁾	Sampling Type ²⁾	Population ²	Sample Size ³
$LFG_{total,y}$, $LFG_{electricity,y}$ and $LFG_{flare,y}$, $Fv_{RG,h}$	SiRS	PS	789,120	6,480
$w_{CH4,y}$, fvi_{h} , $f_{vCH4,RG,h}$	SiRS	PS	789,120	6,480
Operation of energy plant	SiRS	PS	789,120	6,480
T_{Flare}	SiRS	PS	789,120	6,480
$t_{O2,h}$	SiRS	PS	789,120	6,480
$f_{vCH4,FG,h}$	SiRS	PS	789,120	6,480

¹⁾ Sampling Approaches:

SiRS: Simple Random Sampling
 StRS: Stratified Random Sampling
 SS: Systematic Sampling
 CS: Cluster Sampling
 MSS: Multi-stage Sampling

²⁾ Sampling Types:

AS: Acceptance Sampling
 PS: Parameter Sampling
 COM: Full data check at higher data aggregation levels and sampling at original data levels

The verification has been done as following: During the site visit, they had access to all raw data of all parameters available in the PLC system. The data have been extracted directly from the system and transferred to excel files in daily spreadsheets. The system is able to aggregate the data every two minutes and every hour, as required by the applied tool. Due to the high amount of data⁴ the VT sampled some days with data every two minutes and aggregated data every hour. The dates sampled were:

- 04/10/2011, 22/04/2012, 08/07/2012, 13/09/2012, 01/02/2013, 05/05/2013, 29/10/2013, 31/03/2014 and 30/06/2014.

Then, all raw data for each parameter in all above mentioned days were compared with the excel file. The raw data was then verified for its correction.

The verification team considered that the sampled data was enough to attest the correctness of all data as no mistakes were observed.

As exception, the electricity consumed and generated in the project activity (EL_{LFG} / EL_{PR}) were directly taken from the electricity meter data reported monthly. The full set of data was checked for these parameters. No discrepancies were found.

Furthermore, the Emission Factor from the Brazilian Grid was directly taken from the Brazilian DNA website. The monthly data for EF_{OM} and the yearly data for EF_{BM} were taken from all years that belong to the monitoring period.

Apart from the parameters above mentioned, all other are available directly in the PLC system. It is important to point out that the systems already provide all data in excel files daily. The Verification team checked during the site visit nine days complete which was considered enough. However, by having all data available, the verification team checked additionally hundreds of other days off site. And again, no inconsistencies were observed.

Sample Size Calculation

According to "Best practices examples focusing on sample size and reliability calculations", the following equation is applied for sample size calculation.

² Value obtained by multiplying the number of data during the MP. As there is one data every two minutes, during the MP there was 0.5 data x 60minutes x 24hours x 1096 days = 789,120 data. (1096 days from 01/10/2011 until 30/09/2014 which is the last day the PLC registered data.)

³ Corresponding to 9 random days of data = 0.5 data x 60minutes x 24hours x 9 = 6480 data.

⁴ Around 1096 spreadsheets as one spreadsheet per day - 1096 days from 01/10/2011 until 30/09/2014 which is the last day the PLC registered data.

$$n \geq \frac{z^2 \times N \times V}{(N - 1) \times \text{precision}^2 + z^2 \times V}$$

Where:

$$V = \frac{p \times (1 - p)}{p^2}$$

n	Number of elements to be sampled.
N	Total number of elements in the population, (see table below for each of the parameters)
p	Proportion: Set to 0.5 based on the very conservative estimation that 50% of the values checked are found to be incorrect.
z	Constant referring to the level of confidence (for this case 1.645 for 90% as per Guideline for Sampling and Surveys Appendix 1 §9 for SSC project activities).
precision	Required precision (for this case 10%=0.1 as per Guideline for Sampling and Surveys Appendix 1 §9 for SSC project activities).

The following table provides the background information and how many values actually have been checked:

Parameter	Population	Maximum data to be checked according to random sampling	Actual number of data checked
<i>All parameters cited above</i>	789,120	271	6,480

According to the values above and the conservative estimation of 50% wrong values the maximum number of values to be checked for the population would be as following:

The details calculation for sample size is:

$$n \geq \frac{1.645^2 \times 789,120 \times \frac{0.5 \times (1-0.5)}{0.5^2}}{(789,120-1) \times 0.1^2 + 1.645^2 \times \frac{0.5 \times (1-0.5)}{0.5^2}} = 270.51$$

Rounding up, the sample size for verification of these populations is 271.

During the on-site verification, 6,480 values were checked corresponding to 9 full days randomly chosen during the MP each parameter. Hence, more than the required number for the data have been verified. Based on the values from the hourly reports, and based on the underlying original data, the verification team calculated the data aggregation completely independent from the calculation provided by the PP.

The verification team considered its approach robust, bearing in mind the complexity of the system and the reputation of the company Biotecnogas^{/biotecnogas/}, which is responsible for the PLC system.

D.5. Clarification requests, corrective action requests and forward action requests raised

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Compliance of the monitoring report with the monitoring report form (E.1)	1	-	-
Compliance of the project implementation with the registered PDD (E.3)	-	-	-
Post-registration changes (E.4)	1	-	1
Compliance of the monitoring plan with the monitoring methodology including applicable tool and standardized baseline (E.5)	-	-	-

Compliance of monitoring activities with the registered monitoring plan (E.6)	3	-	-
Compliance with the calibration frequency requirements for measuring instruments (E.7)	1	-	-
Assessment of data and calculation of emission reductions or net removals (E.8)	-	3	-
Others (please specify)	-	-	-
Total	6	3	1

SECTION E. Verification findings

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

Means of verification	<p>A draft monitoring report was submitted to the verification team by the project participants. The DOE has made this report publicly available prior to the start of the verification activities. No comments were received.</p> <p>By means of the UNFCCC website it has been checked whether the latest applicable MR template CDM-MR-FORM has been used.</p> <p>Further it has been checked whether the latest instructions for filling out the MR template have been followed. Every section has been checked against the respective guidance.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /MR/ • /MRT/ • /unfccc/ 		
Findings	<input checked="" type="checkbox"/>	The latest reporting template CDM-MR-FORM as listed on the UNFCCC website has been used for the Monitoring Report to be uploaded.	
	<input type="checkbox"/>	The latest instructions for filling out the MR have been followed. No adverse finding has been identified in the course of this verification.	
	<input checked="" type="checkbox"/>	<p>The respective requirements have widely been complied with; however; the following issues needed to be addressed in this context:</p> <ul style="list-style-type: none"> - CL 05: <i>In section E.1 and Section E.2, it was not included an example of all formulae applied as per requirement of instructions for completing MR.</i> 	
Conclusion	<input type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.	
	<input checked="" type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.	

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

During the validation the validating DOE might have raised issues that could not be closed or resolved during the validation stage. For this purpose FARs might have been raised. Likewise FARs might have been raised in the course of previous verifications.

In the course of this verification the latest version of the PDD ^{/PDD/} and the previous verification report ^{/VER/}, where applicable, have been checked in order to identify any remaining forward action requests. For the current monitoring period the following applies:

(i) Open issues from validation:

<input checked="" type="checkbox"/>	There were no open issues which have been addressed in the latest version of the validation report.
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<input type="checkbox"/>	All open issues from the validation have been appropriately addressed in the context of previous verifications.
<input type="checkbox"/>	All issues related to the validation have been appropriately addressed in the course of the current monitoring period (for details please refer to appendix 4)
<input type="checkbox"/>	The following issues related to the validation have not yet been appropriately addressed (for details please refer to appendix 4):
	- N/A

(ii) Open issues from previous verifications:

<input type="checkbox"/>	N/A – as this is the first monitoring period for this CDM project activity.
<input checked="" type="checkbox"/>	There were no open issues which have been addressed in the previous verification report
<input type="checkbox"/>	All issues related to the previous verification have been appropriately addressed in the course of the current monitoring period (for details please refer to appendix 4)
<input type="checkbox"/>	The following issues related to the previous verification have not yet been appropriately addressed (for details please refer to appendix 4):
	- N/A

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

Means of verification	<p>By means of an in-depth review of the PDD in its latest form – as downloaded from the UNFCCC project site - and the checks carried out during the on-site visit an assessment has been carried out whether the project has been implemented and operated in line with the latest approved version of the PDD and whether all physical features of the project are in place. The following has been checked: implemented technology, project equipment as well as monitoring and metering equipment.</p> <p>Further it has been checked if relevant technical equipment of the project activity has been exchanged or modified during the monitoring period and consistent notations of key equipment (meters etc.) in PDD, MR and calculation spreadsheet are applied.</p> <p>Interviews with operational personnel have been carried out, QMS records, maintenance records, instrument specifications were checked in this context. Special focus has further been laid to determine whether a potential phase wise implementation has occurred within the crediting period or any delays with respect to the starting dates have occurred.</p> <p>Further it has been checked whether any observed deviations from the registered project design have been correctly addressed as PRCs.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /PDD/ • /MR/ • /VVS/ • /XLS/ • /MRT/ • /unfccc/ 	
Findings	<input type="checkbox"/>	The project has been implemented as described in the latest version of the PDD as well as in section B.1 of the monitoring report. No deviations thereof have been identified in the course of this verification.
	<input checked="" type="checkbox"/>	<p>The following deviations from the registered / approved project design and or the project description in the MR have been identified in the course of this verification (for further details please refer to section E.4):</p> <ul style="list-style-type: none"> - A temporary deviation from the monitoring plan has been required and was approved by the EB on 04/04/2017 under PRC-3464-002
		In this context the following CARs, CLs have been raised:

	<input checked="" type="checkbox"/>	CL 1 <i>By the explanations described in the MR section B.2.1, it is not clear the proposed temporary deviation due to the outage occurred at the supervisory which caused the lack of monitored data.</i>
		FAR 1 <i>The temporary deviation approved prior to this monitoring period is applicable to this monitoring period and beyond it. It is valid until 04/09/2016, which is the date when the supervisory was fixed.</i>
	<i>In case of phased implementation:</i>	
	<input checked="" type="checkbox"/>	N/A
	<input type="checkbox"/>	The phased implementation has correctly and in sufficient detail been described in the latest version of the PDD.
	<input type="checkbox"/>	The description in section 3.1 of the MR differs in content or the level of detail from the latest version of the PDD. However, the description in the MR is correct and reflects the situation during the site inspection.
	<input type="checkbox"/>	The project description in the PDD/MR is not deemed sufficient. The detailed implementation timeline is as follows: N/A
Conclusion	<input type="checkbox"/>	No CARs/CLs have been raised in this context.
	<input checked="" type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	Please also refer to the Assessment of the PRC-3464-002 for further details.	

E.4. Post-registration changes

- ☒ By means of site visit, document check and interview it could be verified that the project is implemented and operated in line with the latest registered PDD and the applied methodology. However post registration changes have conducted prior to this and during this monitoring period and have already been approved as described in detail in the subsequent steps E.4.1 to E.4.7.
- ☐ Post registration changes have been identified and are assessed in detail in the subsequent steps E.4.1 to E.4.7.

E.4.1. Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline

It has been checked whether Temporary deviations from the registered monitoring plan (TDfrMP) or Temporary deviations from monitoring methodology or standardized baseline (TDfMM) have been applied during this monitoring period. The result is summarized in the table below.

<input type="checkbox"/>	No Temporary deviations from the registered monitoring plan (TDfrMP) or Temporary deviations from monitoring methodology or standardized baseline (TDfMM) have been submitted to the UNFCCC prior to the current monitoring period.	
<input checked="" type="checkbox"/>	The following TDfrMP or TDfMM have been approved or are under approval by the UNFCCC	
	1	Title Alternative monitoring for the Emission Reduction Calculations for the period which the supervisory suffered an outage causing lack of registration of the main monitored data in the whole month of January/2014 and between 01/10/2014 and 04/09/2016. It is important to note that this monitoring period ends 31/12/2015. This alternative monitoring was extended until after the end of this MP.
		Status <input type="checkbox"/> under approval; <input checked="" type="checkbox"/> approved (approval No.: PRC-3464-002)

	Appr.date	04/04/2017	
	Ref. No.	PRC-3464-002	
	2	Title	
	Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved (approval No.:)	
	Appr.date		
	Ref.No.		
<input type="checkbox"/>	During the verification of the current MP no need for a TDfrMP or TDfMM has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA		
<input type="checkbox"/>	An approval of the following TDfrMP or TDfMM is to be requested from the EB for the current MP as appendix 1 of the project standard does apply. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.		
1	Issue:		
2	Issue:		
<input type="checkbox"/>	The following TDfrMP or TDfMM for which appendix 1 of the PS is applicable have been applied:		
1	Issue:		
2	Issue:		

During the verification of this monitoring period, a need of temporary deviation from registered monitoring plan has been identified. The prior approval was requested before the submission of the Request for issuance. The **CL 01** was raised to better reference this request. Please refer to Appendix 4 of this report in order to check the conclusion of this finding.

Furthermore, as the temporary deviation approved is applicable until 04/09/2016 (beyond this monitoring period) a **FAR 01** was raised in order to consider this temporary deviation also in the next monitoring period.

Refer to Appendix 4 for the raised findings.

E.4.2. Corrections

It has been checked whether any corrections to project information or parameters fixed at validation have been approved during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

<input checked="" type="checkbox"/>	During the verification of the current MP no need for corrections has been identified.		
<input type="checkbox"/>	The following corrections have been applied:		
1	Issue:		
2	Issue:		
The PDD has been revised accordingly: (New) version No.: Revision date:			
It is confirmed that the updated / corrected information is an accurate reflection of the actual project information and that the corrected parameters are in accordance with the applied methodology and the monitoring plan.			
<input type="checkbox"/>	A related post registration change has been submitted prior to the issuance request. The approval has been received on DD/MM/YYYY via approval number PRC-XXXX-00Z.		

	<input type="checkbox"/> A related post registration change is submitted along with this issuance request. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC.
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E.4.3. Changes to the start date of the crediting period

<input checked="" type="checkbox"/>	N/A - as this is not the first verification within the crediting period
<input type="checkbox"/>	The PPs do not intend to change the start date of the crediting period.
<input type="checkbox"/>	As the change in the start date was below the related time period as indicated in PS § 277 and § 278 no prior approval was required but only a notification. This notification has been submitted by the PP without involvement of the DOE. The change and new start date has been checked from the related UNFCCC project webpage.
<input type="checkbox"/>	The PPs intend to change the start date of the crediting period. As the intended change in start date beyond the related time period as indicated in PS § 279 prior approval by the Board is required. For detailed assessment of the change please refer to related PRC validation report. As per assessment in this report the DOE confirms that the change to the start date of the crediting period are in line with the related requirements of the VVS and PS.
<input type="checkbox"/>	The approval to change the start date of the crediting period has been received on DD/MM/YYYY via approval number PRC-XXXX-00Z

E.4.4. Inclusion of a monitoring plan to a registered project activity

<input checked="" type="checkbox"/>	N/A - as this monitoring plan was part of the registered PDD
<input type="checkbox"/>	In line with PS § 281 or § 282 the PP has forwarded a monitoring plan to the DOE for validation. No prior approval of the monitoring plan was required as the PP in line with PS § 282 wished to submit the monitoring plan together with the request for issuance for the first monitoring period. Please refer to the related PRC report submitted along with this issuance request for further details w.r.t. the assessment of the PRC..
<input type="checkbox"/>	In line with § 282 the PP submitted a monitoring plan prior to the submission of the request for issuance for validation to the DOE. A DOE has assessed the monitoring plan in line with related VVS requirements and submitted a related PRC report for prior approval. The approval has been received on DD/MM/YYYY via approval number PRC-XXXX-00Z.

E.4.5. Permanent changes from registered monitoring plan, monitoring methodology or standardized baseline

It has been checked whether any permanent changes from the registered monitoring plan (PCfrMP) or applied methodologies (PCfMM) including standardized baselines (PCfSB) have been approved prior or during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

<input checked="" type="checkbox"/>	No PCfrMP, PCfMM or PCfSB have been submitted to the UNFCCC prior to the current monitoring period		
<input type="checkbox"/>	The following PCfrMP, PCfMM or PCfSB have been approved or are under approval by the UNFCCC		
	1	Title	
		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved
		Appr.date	
		Ref. No.	

	2	Title	
		Status	<input type="checkbox"/> under approval; <input type="checkbox"/> approved
		Appr.date	
		Ref.No.	
<input checked="" type="checkbox"/>	During the verification of the current MP no need for a PCfrMP, PCfMM or PCfSB has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA		
<input type="checkbox"/>	An approval of the following PCfrMP, PCfMM or PCfSB is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply.		
	1	Issue:	
	2	Issue:	
<input type="checkbox"/>	The following PCfrMP, PCfMM or PCfSB for which appendix 1 of the PS is applicable have been applied:		
	1	Issue:	
	2	Issue:	

E.4.6. Changes to the project design of a registered project activity

It has been checked whether any changes to the project design (CoPD) have been approved prior or during this monitoring period or submitted with this monitoring report. The result is summarized in the table below.

<input type="checkbox"/>	No CoPD has been submitted to the UNFCCC prior to the current monitoring period		
<input checked="" type="checkbox"/>	The following CoPD have been approved or are under approval by the UNFCCC		
	1	Title	Change of the installed capacity of the Project Activity
		Status	<input type="checkbox"/> under approval; <input checked="" type="checkbox"/> approved
		Appr.date	13/03/2013
		Ref. No.	PRC-3464-001
<input checked="" type="checkbox"/>	During the verification of the current MP no need for a CoPD has been identified. The monitoring plan is in accordance with the approved methodology applied by the PA		
<input type="checkbox"/>	An approval of the following CoPD is to be requested from the EB for the current MP as appendix 1 of the project standard does not apply.		
	1	Issue:	
	2	Issue:	
<input type="checkbox"/>	The following CoPD for which appendix 1 of the PS is applicable have been applied:		
	1	Issue:	
	2	Issue:	

As a consequence of this change to the project design the following corrections were requested and approved by the PRC-3464-001 approved on 13/03/2013

- The equipment indicated in the general layout of biogas plant was reorganized and includes two additional boosters as per the implemented project (Picture A.4.3-1 of registered PDD);
- The total number of drilled vertical wells was increased from 165 to 195, as per the implemented project;

- The collection efficiency of the degassing system was changed from 80% to 85% as the number of wells increased and the closed landfill permitted a more efficient suction of the landfill gas; and
- The operational lifetime of the project activity was changed from 10 years to 12 years, since it is linked to the production of CERs and since registration date has delayed two years from the first estimative in the validation.

E.4.7. Types of changes specific to afforestation and reforestation project activities

<input checked="" type="checkbox"/>	N/A - as this monitoring plan was part of the registered PDD
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E.5. Compliance of monitoring plan with the monitoring methodology including applicable tool and standardized baseline

Means of verification	By means of comparison of the MR with <ul style="list-style-type: none"> (i) the applied CDM methodology (ii) all applicable CDM Meth tools and (iii) if applicable, a standardized baseline the verification team has checked whether the MP is in compliance with the MP related requirements of the applied methodology/tools/SB. The following sources of information have been used in this context: <ul style="list-style-type: none"> • /MR/ • /METH/ • /MT/ • /unfccc/ 		
Findings	<input checked="" type="checkbox"/>	The MP is completely in accordance with the approved methodology applied by the CDM project (last registered/approved version of the PDD)	
	<input checked="" type="checkbox"/>	The breakdown of MP accordance of the referenced tools is as follows:	
		1	Title (of the tool)
			Tool to calculate project or leakage CO ₂ emissions from fossil fuel combustion
			Version
			2
			MP compliance
			<input type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input checked="" type="checkbox"/> N/A (for MP)
		2	Title (of the tool)
			Tool to calculate baseline, project and/or leakage emissions from electricity consumption
			Version
			1
			MP compliance
			<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A (for MP)
		3	Title (of the tool)
			Tool to determine project emissions from flaring gases containing methane
			Version
			01.0.0
			MP compliance
			<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A (for MP)
		4	Title (of the tool)
			Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site

		Version	04	
		MP compliance	<input type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input checked="" type="checkbox"/> N/A (for MP)	
		5	Title (of the tool)	Tool to calculate the emission factor for an electric system
			Version	02.0
			MP compliance	<input checked="" type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input type="checkbox"/> N/A (for MP)
			6	Title (of the tool)
			Version	05.2
			MP compliance	<input type="checkbox"/> full compliance <input type="checkbox"/> findings have been raised <input checked="" type="checkbox"/> N/A (for MP)
			<input type="checkbox"/> The breakdown of MP accordance of the applicable SB is as follows:	
			1	Title (of the SB)
			Version	
			MP compliance	
		<input type="checkbox"/> In this context the following CARs, CLs, FARs have been raised: - N/A:		
Conclusion		<input checked="" type="checkbox"/> No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.		
		<input type="checkbox"/> The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.		
		Regarding aspects that are not specified in the methodology no issues have been identified which may reduce the level of accuracy and completeness of the MP .		

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

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

Means of verification	<p>By means of comparison of the MR and the ER calculation with the latest version of the registered PDD the verification team has checked whether all parameters fixed ex-ante or at renewal of the crediting period have been applied correctly.</p> <p>Further it has been checked whether the GWP for the respective period have been correctly applied.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /MR/ • /XLS/ • /PDD/ • /PS/ • /VVS/ • /unfccc/
Findings	<input checked="" type="checkbox"/> The MR and the ER calculation have considered the parameters fixed ex-ante or at the renewal of the crediting period correctly, no deviations have been observed.

	<input type="checkbox"/>	The following deviations from the parameters fixed ex-ante or at renewal of crediting period have been identified in the course of this verification: - N/A
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.

E.6.2. Data and parameters monitored

Means of verification	<p>During the verification all relevant monitoring parameters (as listed in chapter B.7.1 of the PDD) have been verified with regard to the</p> <ul style="list-style-type: none"> (i) appropriateness of the applied measurement / determination method, (ii) the correctness of the values applied for ER calculation, (iii) the accuracy, and applied QA/QC measures. <p>The results as well as the verification procedure are described parameter-wise in the project specific verification checklist (Appendix 5).</p>	
Findings	<p>CL 02: <i>In section D.2 of the MR, parameterwise, it is not clear the operation period of each equipment</i></p> <p>CL 03: <i>In the section D.2 of the MR, parameter w_{CH4}, it is not clear the absence of data in September 2015.</i></p> <p>CL 04: <i>In the section D.2 of the MR, parameters $LFG_{electricity}$ and w_{CH4}, it is not clear which of the values informed in the section were obtained from actual measurement and which are part of the temporary deviation requested to EB.</i></p> <p>CL 06: <i>According to the information provided in the MR section D.2 parameter "Operation of the energy plant", from 01/10/2014 onwards the engine's working hours could not be registered. However, no information has been reported in the MR and/or ER calculations spreadsheet from May/2014 on. For that reason, it is not clear whether the applied methodology pg 9 is correctly followed as "The working hours of the energy plant(s) and the boiler(s)/air heater(s)/heat generating equipment(s) should be monitored and no emission reduction could be claimed for methane destruction in the energy plant or the boiler/air heater/heat generating equipment during non-operational hours."</i></p> <p>For further details please refer to appendix 4 and 5</p>	
Conclusion	<input type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings are described above and could be closed out. For details please refer to Appendix 4.
		It can be confirmed that all monitoring parameters have been measured / determined without material misstatements and in line with all applicable standards and relevant requirements.

E.6.3. Implementation of sampling plan

Means of verification	<p>The verification team has been checked whether the PPs have applied a sampling approach to determine the monitored values.</p> <p>Further it has been checked whether the PPs have correctly applied the implemented sampling plan including</p>
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	<ul style="list-style-type: none"> (i) description of the implemented sampling design (ii) collected data (iii) analysis of collected data (iv) demonstration on whether the required confidence/precision has been met. <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /MR/ • /XLS/ • /PDD/. 			
Findings	<input checked="" type="checkbox"/>	The PPs have not applied sampling approaches for the parameters monitored.		
	<input type="checkbox"/>	The PPs have applied sampling approaches for the following parameters monitored.		
		1	Parameter:	
			Name:	
			Description on how the sampling efforts and survey comply with the validated sampling plan:	
	2	Parameter:		
		Name:		
		Description on how the sampling efforts and survey comply with the validated sampling plan:		
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:		
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.		
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.		

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

Means of verification	<p>During the verification the relevant monitoring equipment has been checked whether the calibration requirements have been met; especially if the calibration frequency is in line with the requirements of the validated PDD and/or the applicable calibration standards.</p> <p>The results as well as the verification procedure are described equipment-wise in the project specific verification checklist (Appendix 6).</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /MR/ • /XLS/ • /CAL/. 	
Findings	<input type="checkbox"/>	Based on the details listed in appendix 6 the verification team can confirm that all installed monitoring equipment has been duly calibrated for this entire monitoring period.
	<input checked="" type="checkbox"/>	Based on the assessment and information as per appendix 6, delay(s) in calibration have been identified. Equipment that determine Pressure (P) and Temperature (T) of the residual biogas presented delay in its calibration. As T and P are automatically used to normalize the biogas flow and determine the parameters $LFG_{electricity}$ and LFG_{total} , the residual gas flow was considered equal to zero as a conservative measure.
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.

	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	This measure resulted in fewer claimed emission reductions.	

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

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

Means of verification	<p>During the verification the calculation of baseline GHG emissions has been checked. In detail the following has been verified:</p> <ul style="list-style-type: none"> • <i>Transparency</i>: It has been checked whether the calculation of baseline emissions is fully traceable and, where used, the Excel calculation provides all calculation formulae. • <i>Parameter consistency</i>: It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the monitoring report and the calculation spreadsheet. • <i>Correctness</i>: It has been checked whether the applied formulae and methods for calculating baseline emissions are in accordance with the monitoring plan and the approved methodology. • <i>Completeness</i>: It has been checked whether all calculations are complete and without omissions. <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /MR/ • /XLS/. 	
Findings	<input type="checkbox"/>	<p>The calculation of the baseline emissions was found to be fully compliant with the above stated principles.</p> <p>The calculations of baseline GHG emissions or baseline net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied.</p> <p>No errors, miscalculations, omissions, misstatements or incomplete information has been identified.</p>
	<input checked="" type="checkbox"/>	<p>The verification team has identified mistakes in the baseline emissions calculation or the underlying calculation approaches.</p>
	<input checked="" type="checkbox"/>	<p>In this context the following CARs, CLs, FARs have been raised:</p> <p>CAR 01: <i>The data used for calculation of the EF_{grid} and $CEF_{elect,BL}$ is not the latest available for the year 2015.</i></p> <p>CAR 2: <i>According to information provided in the MR section E.1, the parameter $MG_{PR,y}$ was considered "as the highest value, comparing measured quantities of methane going to the flares and/or to the generation sets with the total quantity of methane collected from the Project wells". However this measure is not in accordance with applied methodology and registered PDD</i></p>
Conclusion	<input type="checkbox"/>	<p>No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.</p>
	<input checked="" type="checkbox"/>	<p>The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.</p>
	<p>Where corrections were required a revised baseline emissions calculation was prepared by the PPs and presented to the verification team. All raised issues were addressed appropriately so that it can be confirmed that the baseline calculation is overall correct.</p>	

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

Means of verification	<p>During the verification the calculation of project GHG emissions has been checked. In detail the following has been verified:</p> <ul style="list-style-type: none"> • Transparency: It has been checked whether the calculation of project emissions is fully traceable and, where used, the Excel calculation provides all calculation formulae. • Parameter consistency: It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the monitoring report and the calculation spreadsheet. • Correctness: It has been checked whether the applied formulae and methods for calculating project emissions are in accordance with the monitoring plan and the approved methodology. • Completeness: It has been checked whether all calculations are complete and without omissions. <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /MR/ • /XLS/.
Findings	<input checked="" type="checkbox"/> The calculation of the project emissions was found to be fully compliant with the above stated principles. The calculations of project GHG emissions or actual net GHG removals have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied. No errors, miscalculations, omissions, misstatements or incomplete information have been identified.
	<input checked="" type="checkbox"/> The verification team has identified mistakes in the baseline emissions calculation or the underlying calculation approaches.
	<input type="checkbox"/> In this context the following CARs, CLs, FARs have been raised:
	<input checked="" type="checkbox"/> <p>CAR 01: <i>The data used for calculation of the EF_{grid} and $CEF_{elect,BL}$ is not the latest available for the year 2015.</i></p> <p>CAR 03: <i>Following inconsistencies in the ER calculation spreadsheet</i></p> <ul style="list-style-type: none"> - <i>Tab 'hourly MDBL' column R and X from date 05/09/2013 on, the formula is not correct.</i> - <i>Tab annual report, column AB. The values are not rounded conservatively (round down)</i>
Conclusion	<input type="checkbox"/> No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/> The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	<p>Where corrections were required a revised project emissions calculation was prepared by the PPs and presented to the verification team. All raised issues were addressed appropriately so that it can be confirmed that the project emission calculation is overall correct.</p>

E.8.3. Calculation of leakage GHG emissions

Means of verification	<p>During the verification it has been checked whether leakage emissions have to be considered and, in cases where leakage emissions have to be calculated, the respective calculation of leakage GHG emissions has been checked. In such cases the same verification principles have been considered as for the baseline and project emissions calculation. Please refer to E.8.1 and E.8.2.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /MR/ • /XLS/.
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Findings	<input checked="" type="checkbox"/>	No leakage emissions were to be considered (LE = 0).
	<input type="checkbox"/>	The calculation of the leakage emissions was found to be fully compliant with the above stated principles (see 8.1 and 8.2). The calculations of leakage GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan, the applied methodology and, where applicable, the applied standardized baseline. Any assumptions used in leakage emissions calculations have been justified. Where applicable, appropriate emission factors, IPCC default values, GWPs and other reference values have been correctly applied. No errors, miscalculations, omissions, misstatements or incomplete information have been identified.
	<input type="checkbox"/>	The verification team has identified mistakes in the project emissions calculation or the underlying calculation approaches.
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		Where corrections were required a revised LE calculation was prepared by the PPs and presented to the verification team. All raised issues were addressed appropriately so that it can be confirmed that the baseline calculation is overall correct.

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

Means of verification		The verification team has checked if the MR includes a summary table of the emission reductions calculation specifying separately <ul style="list-style-type: none"> - Total baseline emissions, - Total project emissions, - Total leakage, - Total emission reductions. It has been assessed whether the values are correct or need to be revised as a consequence of issues identified above.
Findings	<input checked="" type="checkbox"/>	Section E.4 of the MR includes in a summary table of the emission reductions calculation.
	<input checked="" type="checkbox"/>	The summary table specified the total baseline, project and leakage emissions as well as the total emission reductions separately.
	<input checked="" type="checkbox"/>	The values as specified in the ER summary table are correct; no issues have been identified during the verification which requires changes in the ER calculation.
	<input checked="" type="checkbox"/>	During the verification issues with impact on the ER calculation have been identified.
	<input checked="" type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised: CAR 01: <i>The data used for calculation of the EF_{grid} and $CEF_{elect,BL}$ is not the latest available for the year 2015.</i> CAR 2: <i>According to information provided in the MR section E.1, the parameter $MG_{PR,y}$ was considered "as the highest value, comparing measured quantities of methane going to the flares and/or to the generation sets with the total quantity of methane collected from the Project wells". However this measure is not in accordance with applied methodology and registered PDD</i>
Conclusion	<input type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.

	<input checked="" type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.

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

Means of verification	The verification team has checked if the MR includes a comparison of actual values of the monitoring period with the estimations in the registered PDD. It has further checked which of the below listed cases is applicable for the calculated ER of the current monitoring period.	
Findings	<input checked="" type="checkbox"/>	Case 1: The ex-ante estimated value was found to be proportionally higher than the ex-post determined value. No further action is deemed required.
	<input type="checkbox"/>	Case 2: The ex-ante estimated value fits very good to the actually monitored value. No further justification is deemed required.
	<input type="checkbox"/>	Case 3: The ex-ante estimated value was found to be proportionally lower than the ex-post determined value.
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.

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

Means of verification	On the basis of the above comparison of actual values of the monitoring period with the estimations in the registered PDD (E.8.5) the verification team has checked whether (in case 3) an appropriate explanation is included in the MR.	
Findings	<input checked="" type="checkbox"/>	No further justification or explanation is deemed required as actual emissions of this MP do not exceed significantly the ex-ante calculated emission reductions (applicable for case 1 and 2).
	<input type="checkbox"/>	For case 3: The PP has provided a related justification in the MR. The reasons for the increase are as follows: - N/A
	<input type="checkbox"/>	In this context the following CARs, CLs, FARs have been raised:
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		Not applicable

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

Means of verification	The verification team has checked chapter E.4 of the MR and the emission reduction calculation sheet /XLS/.	
Findings	<input checked="" type="checkbox"/>	The MR in section E.4 includes a summary table of the ER breakdown a) ER up to 2012-12-31 and b) ER from 2013-01-01 onwards
	<input type="checkbox"/>	The breakdown of the ERs during the first commitment period and from 2013-01-01 onwards is as follows:

	<input type="checkbox"/> The ER have completely been generated during the first commitment period <input type="checkbox"/> The ERs have completely been generated from 2013-01-01 onwards, <input checked="" type="checkbox"/> The ERs have partly been generated during the first commitment period and partly from 2013-01-01 onwards. <input type="checkbox"/> The breakdown of the ERs is correct, considering the applicable guidance.										
	<table border="1"> <thead> <tr> <th></th> <th>until 2012-12-31 ¹⁾</th> <th>from 2013-01-01 ¹⁾</th> <th>Sum</th> </tr> </thead> <tbody> <tr> <td>Emission reductions [tCO_{2e}]</td> <td>281,864</td> <td>327,702</td> <td>609,566</td> </tr> </tbody> </table>				until 2012-12-31 ¹⁾	from 2013-01-01 ¹⁾	Sum	Emission reductions [tCO _{2e}]	281,864	327,702	609,566
		until 2012-12-31 ¹⁾	from 2013-01-01 ¹⁾	Sum							
	Emission reductions [tCO _{2e}]	281,864	327,702	609,566							
¹⁾ Both days included											
Conclusion	<input type="checkbox"/>	No CARs/CLs/FARs have been raised in this context. No correction was required. The project is in line with the respective requirements.									
	<input checked="" type="checkbox"/>	The raised CARs/CLs/FARs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.									
	The data provided in the MR is correct as well as the related breakdown. The pro-rata approach was correctly applied to the calculations of GHG emission reductions or net anthropogenic GHG removals in accordance with the project standard, as the monitoring period starts before 31 December 2012 and ends anytime thereafter.										

SECTION F. Internal quality control

Before the submission of the final verification report a technical review of the whole verification procedure was carried out. The technical reviewers are competent GHG auditors being appointed for the scope this project falls under. The technical reviewers are not considered to be part of the verification team and thus not involved in the decision making process up to the technical review.

As a result of the technical review process the verification opinion and the topic specific assessments as prepared by the verification team leader may have been confirmed or revised. Furthermore reporting improvements might have been achieved.

After the successful technical review an overall (esp. procedural) assessment of the complete verification has been carried out by a senior assessor located in the accredited premises of TÜV NORD.

After this step the submission for requesting for issuance is conducted.

SECTION G. Verification opinion

Consortio Horizonte Asja has commissioned the TÜV NORD JI/CDM Certification Program to carry out the 2nd periodic verification of the project: "Exploitation of the biogas from controlled landfill in solid waste management central – CTRS / BR.040", with regard to the relevant requirements for CDM project activities. The project reduces GHG emissions due to generation of electricity from biogas from landfill (renewable source) and destruction of this biogas by flaring. This verification covers the period from 01/10/2011 to 31/12/2015 (including both days).

As a result of this verification, the verifier confirms that:

- all operations of the project are implemented and installed as planned and described in the validated project design document,
- the monitoring plan is in accordance with the applied approved CDM methodology, i.e., ACM0001 ver.11,
- the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately,
- the monitoring system is in place and functional. The project has generated GHG emission reductions,
- the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner.

TÜV NORD JI/CDM CP further confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Emission reductions: 609,566 t CO_{2e}.

SECTION H. Certification statement

As a duly accredited DOE, TÜV NORD CERT confirms that the project

"Exploitation of the biogas from controlled landfill in solid waste management central – CTRS / BR.040"

registered under

UNFCCC-No. : 3464

has achieved emission reductions in accordance with all applicable requirements for registered CDM project activities during the current monitoring period

MP-No.: 02

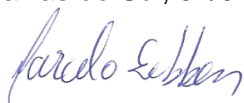
from: 01/10/2011

to: 31/12/2015

(including both days) as follows:

Emission reductions: 609,566 t CO_{2e}.

Caxias do Sul, 31/07/2017



Marcelo Sebben
Team leader

Appendix 1. Abbreviations

Abbreviations	Full texts
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CCEE	Commercialization Chamber of Electric Energy (Camara de Comercialização de Energia Elétrica)
CDM	Clean Development Mechanism
CEMIG	Electric Company of Minas Gerais (Companhia Elétrica de Minas Gerais)
CER	Certified Emission Reduction
CO ₂	Carbon dioxide
CO _{2eq}	Carbon dioxide equivalent
CL	Clarification Request
DVerR	Draft Verification Report
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse gas(es)
IM	Interview Memo
MP	Monitoring Plan
MR	Monitoring Report
ONS	National System Operator (Operador Nacional do Sistema)
PA	Project Activity
PDD	Project Design Document
PP	Project Participant
QA/QC	Quality Assurance / Quality Control
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard
XLS	Emission Reduction Calculation Spread Sheet

Page 31 of 89
Rev. 20 /09.15

Appendix 3. Documents reviewed or referenced

No.	Reference	Author	Title	References to the document	Provider
1	/ACM01/	UNFCCC	ACM0001 - version 11 – Consolidated baseline and monitoring methodology for landfill gas project activities	https://cdm.unfccc.int/filestorage/U/J/B/UJBDVFYLQKSEWCM73XG14Z692TRHO0/EB47_repa_n06_ACM0001ver11.pdf?t=NIB8bnM3ZXRpfDDbMkC6RMNWbJxysDrbTk6t	Other
2	/BIO/	Biotechnogas	Aggregation data software - Biotechnogas	2013-01-16	PP
3	/CAL/		<p><u>Calibration certificates done by third parties for the parameters:</u></p> <ul style="list-style-type: none"> - LFG_{total} - LFG_{flare} - $LFG_{electricity}$ - EL_{LFG} - $EL_{PR,y}$ - $FV_{RG,h}$ - T_{flare} - Internal calibration form – FO-CAL/002 ver.2 – used for monthly calibration of biomass gas analyser (w_{ch4}, $fv_{i,h}$, $fv_{CH4,RG,h}$) - Internal calibration form – FO-CAL/003 ver.4 – used for monthly calibration of exhaust gas analyser (to_2, $fv_{CH4,FG,h}$) <p>The calibration dates are all described in the Appendix 6 of the verification report</p> <p><u>Emails from the meters manufacturers regarding the calibration frequency</u></p> <ul style="list-style-type: none"> - Email from ECIL stating calibration frequency of thermocouples (T_{flare}, and T) of one year - Email from ABB stating calibration frequency of the manometer (P) of one year 		

			<ul style="list-style-type: none"> - Email from SMAR stating calibration frequency of the manometer (P) of one year - Email from CEMIG stating that there is no need of calibration of electricity meters after initial calibration - Flow meter– Rosemount type 285 Annubar – Product data sheet states up to 10 year calibration cycles. - Ultramat 23 User Manual stating calibration frequency of the gas analysers every year (parameters w_{CH_4}, $f_{V_{i,h}}$, t_{O_2}, $f_{V_{CH_4,RG}}$, $f_{V_{CH_4,FG}}$) 		
4	/CPM/	DOE	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)	-	Other
5	/ELEC/	CCEE CEMIG PP	<ol style="list-style-type: none"> 1. Electricity measured every 5 minutes provided by CCEE 2. Monthly reports using aggregated data obtained by CCEE 3. Imported electricity invoices issued by CEMIG 4. Exported electricity reports informed to Belo Horizonte City Hall 5. Monthly electricity receipt of sales 		PP
6	/GOT/	UNFCCC	Glossary “CDM terms” (version 08.0)	https://cdm.unfccc.int/filestorage/e/x/t/extfile-20150226124447549-glos_CDM.pdf/glos_CDM.pdf?t=UmZ8bnFjODI3fDCW9A3vJwR03kQQh4sbLiYu	Other
7	/INST/		<ol style="list-style-type: none"> 1. Equipment exchange registration form – FO_SUBS_001 ver.1 2. Equipment exchange registration form – FO_SUBS_001 ver.2 		
8	/IPCC/	IPCC	<ol style="list-style-type: none"> 1. 1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book 2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book 	www.ipcc-nggip.iges.or.jp	Other
9	/KP/	UNFCCC	Kyoto Protocol (1997)	http://unfccc.int/kyoto_protocol/items/2830.php	Other
10	/LEG/	CONAMA	Applicable legislation:	2006-12-26	Other

		ABNT NBR	1. Resolution No. 382, maximum limits for emissions from fixed sources	1992	
		ABNT NBR	2. ABNT NBR 8419/1992 – Landfill Urban Solid Waste Project Presentation – procedure	1997	
			3. ABNT NBR 13896/1997 – Non Dangerous Landfill Waste. Criteria for project, implementation and operation		
11	/LIC/	SMMA ANEEL METRUM	1. Operation License to collect and burn of Biogas system and electricity generation – # 0361/11 2. Annel Authorization # 4/2013-SCG/ANEEL regarding the authorization of electricity dispatch to the grid issued on 03/01/2013 3. Commissioning report of the electric substation	Validity 2016-05-17 2013 23/09/2010	PP
12	/MA/	UNFCCC	Decision 3/CMP. 1 (Marrakesh – Accords)	http://cdm.unfccc.int/Reference/COPMOP/index.html	Other
13	/MR/	PP	Monitoring Report “Exploitation of the biogas from Controlled Landfill in Solid Waste Management Central – CTRS / BR.040” – 2nd Monitoring period 1. version 1 2. version 2 3. version 3	05/05/2016 22/03/2017 31/07/2017	
14	/MRT/	UNFCCC	Monitoring Report Form (CDM-MR-FORM), Version 5.1	https://cdm.unfccc.int/Reference/PDDs_Forms/index.html	Other
15	/OPER/	PP	Maintenance logbook records stating the operational hours of the engines		Other
16	/PDD/	UNFCCC	Project Design Document for CDM project: “Exploitation of the biogas from Controlled Landfill in Solid Waste Management Central – CTRS / BR.040” - version 3, dated 2012-10-03	http://cdm.unfccc.int/Projects/DB/SGS-UKL1267696608.78/view	Other
17	/PRC/	UNFCCC	1. Post registration change number PRC-3464-001 approved on 2013-03-15 2. Validation opinion for Post Registration Changes # PRJC-344687-2011-CCS-BRA issued by DNV on 2012-10-26 3. Estimated ER calculations during PRC-3464-001 “ Appendix 1 - 3 BR.040 CER estimation for revised PDD 2012.10.03.xls ” found in the UNFCCC website, project's page, regarding the values of MG _{PR}	http://cdm.unfccc.int/PRCContent/DB/prcp609499480/view	Other

			http://cdm.unfccc.int/PRCCContainer/DB/prcp609499480/view 4. PRC regarding temporary changes approved on 04/04/2017 under # PRC-3464-002		
18	/PRO/		1. Management Manual regarding biogas Power Plant – BRMG BIO MAN_MAN 003 ver.3 2. Accuracy class of the electricity meters (According to ONS Procedure – Module 12)		
19	/PS/	UNFCCC	CDM Project Standard (Version 9.0)	http://cdm.unfccc.int/Reference/Standards/index.html	Other
20	/RAW/	Biotechnogas	1. Log data – parameters obtained from system every 2 minutes 2. - Hourly report – Data aggregated hourly for calculations		
21	/SAMPL E/	UNFCCC	1. “Guidelines for Sampling and Surveys for CDM Project Activities and Programme Activities” (Version 03.0) 2. “Standard for Sampling and Surveys for CDM Project Activities and Programme Activities” (version 4.1)	https://cdm.unfccc.int/Reference/Guidclarif/index.html http://cdm.unfccc.int/Reference/Standards/index.html	Other
22	/TECH/	Biotechnogas ABB Ultramat Ultramat Ecil ION	<u>FLARE</u> • Technical Specification of the Flare <u>FLOW METER</u> • Technical description manual for flow meter <u>GAS ANALYSER (Inlet – Landfill gas)</u> • Operation Instructions for IR-Absorbins gases and oxygen <u>GAS ANALYZSR (Outlet – exhaust gas)</u> • Operation Instructions for IR-Absorbins gases and oxygen <u>THERMOCOUPLE</u> • Technical Manual of the Thermocouples with Elsi information. <u>ELECTRICITY METER</u> • Technical description data of electricity meter.		PP
23	/TOOL/	UNFCCC	1. Tool for the demonstration and assessment of additionality – version 05.2 2. Tool to determine methane emissions avoided from disposal	http://cdm.unfccc.int/Reference/tools/index.html	Other

			<p>of waste at a solid waste disposal site – version 04</p> <p>3. Tool to calculate baseline, project and/or leakage emissions from electricity consumption – version 01</p> <p>4. Tool to determine project emissions from flaring gases containing methane – version 01.0.0</p> <p>5. Tool to calculate the emission factor for an electricity system – version 02.2.0</p> <p>6. Tool to calculate project or leakage CO2 emissions from fossil fuel combustion – version 02</p>		
24	/TRAIN/	VITAL ASJA DATTE	<p>1. Control of Training and courses offered to the employee (excel Spreadsheet)</p> <p>2. Training on Landfill Gas technology and power plant operation / instrument calibration- Certificates (FO Train ver.2) –</p> <p>2.1 Áquila Urias Mendes da Silva – 07/11/2014</p> <p>2.2 Daniel Gonçalves Vieira Jr. 18/08/2014 to 03/09/2014</p> <p>2.3 Wanderlay Sidney Cardoso Bonifácio – 02/12/2013</p> <p>3. Trainnig NR 10 (Safety in Electricity Services</p> <p>3.1 Arnaldo Benkard Hayashibara – 28/07/2014 to 16/09/2015</p> <p>3.2 Daniel Gonçalves Vieira Jr. – 21/07/2014 to 17/09/2014</p> <p>4. Health and Safety Good Practices</p> <p>4.1 Daniel Gonçalves Vieira Jr.- 15/05/2014</p> <p>4.2 Marcos Antonio de Freitas - 15/05/2014</p> <p>4.3 Wanderlay Bonifácio 15/05/2014</p> <p>4.4 Ailton Moreira - 15/05/2014</p>		
25	/VAL/	SGS	<p>1. Validation Report for CDM project # CDM.VAL2246 “Exploitation of the biogas from Controlled Landfill in Solid Waste Management Central – CTRS / BR.040” – revision 3.4 – 2011-03-14</p>	http://cdm.unfccc.int/Projects/DB/SGS-UKL1267696608.78/view	Other
26	/VER/	PP	Documents of previous verifications (Monitoring report, verification report, ER calculation sheet)	http://cdm.unfccc.int/Projects/DB/ERM-CVS1283351787.62/view	Other
27	/VVS/	UNFCCC	CDM Validation and Verification Standard (Version 09.0)	http://cdm.unfccc.int/Projects/DB/SGS-	Other

				UKL1267696608.78/view	
28	/XLS/	PP	Excel spreadsheets: Emissions reduction calculation spreadsheet 1. Version 3 2. Version 5 3. Version 8	- 05/05/2016 - 22/03/2017 - 31/07/2017	PP
29	/dna/	-	DNA of Brazil	http://www.mct.gov.br	Other
30	/ipcc/	-	IPCC publications	www.ipcc-nggip.iges.or.jp	Other
31	/unfccc/	-	UNFCCC	http://cdm.unfccc.int	Other

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

Table 3. Remaining FAR from validation and/or previous verification

FAR ID	XX	Section no.	E.2	Date: DD/MM/YYYY
Description of FAR				
N/A				
Project participant response (1 st round)				Date: DD/MM/YYYY
Documentation provided by project participant (1 st round)				
<input type="checkbox"/>	Changes in the PDD	Section(s):	New version No.:	
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:	
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:	
<input type="checkbox"/>	Other:			
DOE assessment (1 st round)				Date: DD/MM/YYYY
Conclusion Tick the appropriate checkbox				
<input type="checkbox"/>		Additional action should be taken (finding remains open)		
<input type="checkbox"/>		The finding is closed		

Table 4. CL from this verification

CL ID	01	Section no.	B.2.1	Date: 23/06/2016
Description of CL				
By the explanations described in the MR section B.2.1, it is not clear the proposed temporary deviation due to the outage occurred at the supervisory which caused the lack of monitored data.				
Project participant response (1 st round)				Date: 22/03/2017
A more detail explanation was included in the section B.2.1. of the MR, according to the approved PRC.				
Documentation provided by project participant (1 st round)				
<input type="checkbox"/>	Changes in the PDD	Section(s):	New version No.:	
<input checked="" type="checkbox"/>	Changes in MR	Section(s): B.2.1	New version No.: 2	
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:	
<input type="checkbox"/>	Other:			
DOE assessment (1 st round)				Date: 20/04/2017

The verification team confirmed that the proposed temporary deviation is well described in the section B.2.1 of the MR.

From 01/01/2014 to 31/01/2014 and from 01/10/2014 to 04/09/2016 the PP was being unable to provide information from the monitored data related to landfill gas measurement due to an outage of the measurement system (PLC). Instead, the PP is proposing an alternative reverse calculation for these periods.

The temporary deviation needed prior approval by the board. The approval was given on 04/04/2017 under the number PRC-3464-002

CL is closed

Conclusion

Tick the appropriate checkbox

- ☐ Additional action should be taken (finding remains open)
☒ The finding is closed

CL ID	02	Section no.		Date: 23/06/2016
Description of CL				
<i>In section D.2 of the MR, parameterwise, it is not clear the operation period of each equipment.</i>				
Project participant response (1st round)				Date: 22/03/2017
<i>Clearer information regarding the operation period of each equipment was included in the section D.2 of the MR</i>				
Documentation provided by project participant (1st round)				
<input type="checkbox"/>	Changes in the PDD	Section(s):	New version No.:	
<input checked="" type="checkbox"/>	Changes in MR	Section(s): D.2	New version No.: 2	
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:	
<input type="checkbox"/>	Other:			
DOE assessment (1st round)				Date: 20/04/2017
<i>The operation period of all equipment were detailed parameterwise in QA/QC procedures, section D.2 of the MR.</i>				
<u>CL is closed</u>				
Conclusion				
<i>Tick the appropriate checkbox</i>		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

CL ID	03	Section no.		Date: 23/06/2016
Description of CAR				
<i>In the section D.2 of the MR, parameter w_{CH_4}, it is not clear the absence of data in September 2015.</i>				
Project participant response (1st round)				Date: 22/03/2017
<i>The PP missed the deadline to calibrate the fixed gas analyzer in September 2015, for this reason the maximum error would be applied to the registered value for the period in which the calibration program failed. However, due to the approved temporary deviation, applying the maximum error to the registered value does not affect the calculated emission reductions. So, for all the period in which the approved temporary deviation is applied the w_{CH_4} is 50% fixed.</i>				
Documentation provided by project participant (1st round)				
<input type="checkbox"/>	Changes in the PDD	Section(s):	New version No.:	
<input checked="" type="checkbox"/>	Changes in MR	Section(s): D.2	New version No.: 2	
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:	
<input type="checkbox"/>	Other:			
DOE assessment (1st round)				Date: 20/04/2017
<i>It is now clear in the MR, section D.2 parameter w_{CH_4}, all applied values during the monitoring period. It is important to point out that even though the measured values were not applied during September/2015, the PP carried out its calibration procedures from October/2015 on. The information regarding calibration dates of gas analyser is available in MR and FVR Appendix 6.</i>				
<u>CL is closed</u>				
Conclusion				
<i>Tick the appropriate checkbox</i>		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

CL ID	04	Section no.		Date: 23/06/2016
Description of CL				
<i>In the section D.2 of the MR, parameters $LFG_{electricity}$ and w_{CH4}, it is not clear which of the values informed in the section are obtained from actual measurement and which are part of the temporary deviation requested by EB.</i>				
Project participant response (1st round)				Date: 22/03/2017
Clarifications were included in the MR, section D.2.				
Documentation provided by project participant (1st round)				
<input type="checkbox"/>	Changes in the PDD	Section(s):	New version No.:	
<input checked="" type="checkbox"/>	Changes in MR	Section(s): D.2	New version No.: 2	
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:	
<input type="checkbox"/>	Other:			
DOE assessment (1st round)				Date: 20/04/2017
Information was duly clarified in the MR section D.2 under Value of monitored parameter for $LFG_{electricity}$ and w_{CH4} .				
CL is closed				
Conclusion Tick the appropriate checkbox		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

CL ID	05	Section no.		Date: 23/06/2016
Description of CL				
<i>In section E.1 and Section E.2, it was not included an example of all formulae applied as per requirement of instructions for completing MR.</i>				
Project participant response (1st round)				Date: 22/03/2017
Formulae was included in the MR, sections E.1 and E.2.				
Documentation provided by project participant (1st round)				
<input type="checkbox"/>	Changes in the PDD	Section(s):	New version No.:	
<input checked="" type="checkbox"/>	Changes in MR	Section(s): E.1 and E.2	New version No.: 2	
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:	
<input type="checkbox"/>	Other:			
DOE assessment (1st round)				Date: 20/04/2017
The requirements of guidelines for completing the MR were duly followed.				
CL is closed				
Conclusion Tick the appropriate checkbox		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

CL ID	06	Section no.	D.2	Date: 23/06/2017
Description of CL				
<i>According to the information provided in the MR section D.2 parameter "Operation of the energy plant", from 01/10/2014 onwards the engine's working hours could not be registered. However, no information has been reported in the MR and/or ER calculations spreadsheet from May/2014 on. For that reason, it is not clear whether the applied methodology pg 9 is correctly followed as "The working hours of the energy plant(s) and the boiler(s)/air heater(s)/heat generating equipment(s) should be monitored and no emission reduction could be claimed for methane destruction in the energy plant or the boiler/air heater/heat generating equipment during non-operational hours."</i>				
Project participant response (1st round)				Date: 06/07/2017
<p><i>Before the complete outage of the supervisory software in October/2014, the data registration system presented point failures. One of them was stopping registering the working hours of the engines between March and April/2014. Notwithstanding the point failure in the supervisory software, the engines operated without constraints, and the working hours were manually registered in internal maintenance forms.</i></p> <p><i>Clarification was added to the MR, as well as indicative number of working hours for the period March-September/2014.</i></p>				

Documentation provided by project participant (1 st round)		
<input type="checkbox"/> Changes in the PDD	Section(s):	New version No.:
<input checked="" type="checkbox"/> Changes in MR	Section(s): D.2	New version No.: 3
<input type="checkbox"/> Changes in XLS	Worksheet(s):	New version No.:
<input checked="" type="checkbox"/> Other: /OPER/	<i>Maintenance logbook listing the operation hours of the engines</i>	
DOE assessment (1 st round)		Date: 10/07/2017
<p>Evidences of manual monitoring were provided to the verification team^{/OPER/}. Even though the system was not automatically recording the hours of operation of the engines, the parameter was still monitored as per PDD, which is measured by hours count meters and aggregated at least yearly. The aggregation of this data was made yearly and monthly in the ER calculation spreadsheet^{/XLS/} which, again, is in accordance with the monitoring plan.</p> <p>Furthermore, in order to cross-check the consistency of the data, the values of electricity generated were compared against data from CCEE^{/ELEC/}, which is the official source of data used for commercial purposes. It was observed that the electricity generated, measured by the company^{/RAW/} was in accordance with these official reports. This information evidences that electricity generated was duly measured and, as the only source of generation are the engines, it attests that the operational hours of the engines are consistent.</p> <p>The MR and excel were completed accordingly and this measure was duly clarified. The maintenance logbook^{/OPER/} has been provided to the verification team attesting the operation of the engines and its operational hours.</p>		
CL is closed		
Conclusion Tick the appropriate checkbox	<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed	

Table 5. CAR from this verification

CAR ID	01	Section no.		Date:	23/06/2016
Description of CAR					
<i>The data set used for calculation of the EF grid is not the latest available.</i>					
Project participant response (1 st round)					Date:
					22/03/2017
<i>EF for the year 2015 was used in the calculation.</i>					
Documentation provided by project participant (1 st round)					
<input type="checkbox"/> Changes in the PDD	Section(s):		New version No.:		
<input checked="" type="checkbox"/> Changes in MR	Section(s): D.2; E.1 and E.2		New version No.: 2		
<input checked="" type="checkbox"/> Changes in XLS	Worksheet(s):		New version No.: 5		
<input type="checkbox"/> Other:					
DOE assessment (1 st round)					Date:
					20/04/2017
<p>The value used in calculations for EF_{CM,2015} were taken from information provided by Brazilian DNA. The original data was checked and correctly applied in the ER calculations for the year 2015</p>					
CAR is closed					
Conclusion Tick the appropriate checkbox	<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed				

CAR ID	02	Section no.		Date:	23/06/2016
Description of CAR					
<i>According to information provided in the MR section E.1, the parameter MG_{PR,y} was considered "as the highest value, comparing measured quantities of methane going to the flares and/or to the generation sets with the total quantity of methane collected from the Project wells". However this measure is not in accordance with applied methodology and registered PDD</i>					
Project participant response (1 st round)					

According to the applied methodology the $MG_{PR,y}$ is the amount of methane generated during year y of the project activity estimated using the actual amount of waste disposed in the landfill as per the version 04 of the "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" as registered in the PDD. Values from the registered PDD were applied in the ER calculations and corrections were made in the MR section E.1

Documentation provided by project participant (1 st round)		Date: 22/03/2017
<input type="checkbox"/> Changes in the PDD	Section(s):	New version No.:
<input checked="" type="checkbox"/> Changes in MR	Section(s): E.1	New version No.: 2
<input checked="" type="checkbox"/> Changes in XLS	Worksheet(s): "Hourly MDBL"	New version No.: 5
<input type="checkbox"/> Other:		

DOE assessment (1st round) Date: 20/04/2017

As per applied methodology and registered PDD, the parameter $MG_{PR,y}$ is the "Amount of methane generated during year y of the project activity estimated using the actual amount of waste disposed in the landfill as per the version 04 of the "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site". The applied values now were obtained directly from the registered PDD, table B 6.3-6 page 51, which were obtained through the application of the above tool. These original values, not rounded, which were used in the ER calculations, were taken directly from the Estimated ER calculations spreadsheet approved under PRC-3464-001 available under the UNFCCC website^{/PRC-3/}. It can be observed in the ER calculations^{/XLS/} that the annual values were applied to the hourly data, and divided by number of hours in the year. The data was checked and compared to the ones estimated in the PDD for each year and are considered correct.

CAR is closed

Conclusion Tick the appropriate checkbox	<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed
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CAR ID	03	Section no.	Excel spreadsheet	Date: 23/06/2017
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Description of CAR

Following inconsistencies in the ER calculation spreadsheet

- Tab 'hourly MDBL' column R and X from date 05/09/2013 on, the formula is not correct.
- Tab annual report, column AB. The values are not rounded conservatively (round down)

Project participant response (1st round) Date: 06/07/2017

The formulae in column R and X of Hourly MDBL tab was correct, so the dates between that tab and Hourly Flare Efficiency tab match.

The values in the column AB or Annual report tab were rounded conservatively.

Documentation provided by project participant (1st round)

<input type="checkbox"/> Changes in the PDD	Section(s):	New version No.:
<input type="checkbox"/> Changes in MR	Section(s):	New version No.:
<input checked="" type="checkbox"/> Changes in XLS	Worksheet(s): Hourly MDBL ; Annual report	New version No.: 06
<input type="checkbox"/> Other:		

DOE assessment (1st round) Date: 10/07/2017

The excel spreadsheet was corrected and it has been observed that there is no gap in the tab "Hourly MDBL" column R and X as found in the previous version of the document

Furthermore, in the tab "Annual Report" the values in the column AB were rounded down.

CAR is closed

Conclusion Tick the appropriate checkbox	<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed
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Table 6. FAR from this verification

FAR ID	01	Section no.		Date: 20/04/2017
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Description of FAR

The temporary deviation approved prior to this monitoring period is applicable to this monitoring period and beyond it. It is valid until 04/09/2016, which is the date when the supervisory was fixed.

Project participant response		Date: 20/04/2017	
<i>Calculations will be conducted as per applied PRC-3464-002 approved on 04/04/2017.</i>			
Documentation provided by project participant			
<input type="checkbox"/> Changes in the PDD	Section(s):	New version No.:	
<input type="checkbox"/> Changes in MR	Section(s):	New version No.:	
<input type="checkbox"/> Changes in XLS	Worksheet(s):	New version No.:	
<input type="checkbox"/> Other:			
DOE assessment		Date: 20/04/2017	
Application of the PRC shall be carried out during the next verification between 01/01/2016 and 04/09/2016			
Conclusion <i>Tick the appropriate checkbox</i>	<input checked="" type="checkbox"/> To be checked during the next periodic verification		

Appendix 5. Monitored Parameters

Table A-5: Periodic Verification Checklist – Monitored Parameters

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
A.1. LFG_{total,y}		Total amount of Landfill gas captured at Normal Temperature and Pressure		
<p>a) Measurement / Determination method (VVS, §§ 389-393) Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</p>	<p>/IM01/ /PDD/ /ACM01/</p>	<p><i>Description:</i> The parameter is measured by one flow-meter installed just before the pipe diversion into flare and engines. Thus it measures the total landfill gas extracted by the project activity.</p> <p>The flow meter used is manufactured by Rosemount. The data is continuous measured, recorded every two minutes and aggregated hourly, monthly and yearly for ER calculations.</p> <p>The flow meter measures the flow in normalized cubic meters per hour (Nm³/h). This is possible as the system executes an automatic calculation taking into consideration measures of pressure and temperature of the landfill gas.</p> <p><i>Verifier's action:</i> During the site visit, the verification team had access to and inspected all equipment and data control system</p> <p><i>Conclusion:</i> during the monitoring period, in the whole month of January 2014 and from October 2014 until the end of the period, the supervisory system suffered an outage and no flow data was recorded. Thus, the PP applied a temporary deviation for this period in order to calculate the Emission Reductions, which was approved by the board on 04/04/2017 under the PRC-3464-002. Refer to CL 01.</p> <p>(CL 01) <i>By the explanations described in the MR section B.2.1, it is not clear the proposed temporary deviation due to the outage</i></p>	CL-04	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<i>occurred at the supervisory which caused the lack of monitored data.</i>		
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400)</p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p> <p><i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i></p>	/CAL/ /MR/	<p><i>Description:</i> The information of operation and calibration of the instruments were provided by the manufacturer^{/CAL/}.</p> <p>As a biogas safety measure, whenever temperature of the landfill gas reaches above 60°C (140°F), the system is shut down.</p> <p>The temperature and pressure meters used to normalize the biogas flow are calibrated as per manufacturer specification.</p> <p>The relevant calibration dates of the meters can be observed in appendix 6 of this report and their calibration frequency were evidenced to the verification team.</p> <p><i>Verifier's action:</i> The calibration certificates and statements from manufacturer were reviewed, and compared to information provided in the MR</p> <p><i>Conclusion:</i> The Flow meters are calibrated as per manufacturer which is in accordance with the MP. For the periods when the calibration of temperature probes or the relative pressure probes were delayed, the flow is considered equal to zero. The verification team observed this consideration in the ER spreadsheet and considered this measure conservative.</p>	OK	OK
<p>c) Correctness (VVS, §§ 389-393)</p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i></p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>	/MR/ /RAW/ /CAL/	<p><input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i> The verification team has checked the raw data^{/RAW/} from the PLC system against the LFG values applied in the ER calculation spreadsheet and all data was found correct. No discrepancies in the measured data or mistakes have been identified. The missing data is treated in CL 01.</p> <p><i>Verifier's action:</i> the value has been reviewed during the site visit by cross-checking the data records stored in the company's database at the site with corresponding ER spreadsheets. Calibration certificates^{/CAL/} were also checked by the verification team.</p>	CL-04	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<i>Conclusion:</i> During the monitoring period, in the whole month of January 2014 and from October 2014 until the end of the period, the supervisory system suffered an outage and no flow data was recorded. Thus, the PP applied a temporary deviation for this period in order to calculate the Emission Reductions, which was approved by the board on 04/04/2017 under the PRC-3464-002. Refer to CL 01 above		
A.2. LFG_{flare,y}		Amount of landfill gas flared		
<p>a) Measurement / Determination method (VVS, §§ 389-393) Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</p>	<p>/IM01/ /PDD/ /ACM01/</p>	<p><i>Description:</i> The parameter is measured by one flow-meter installed after the pipe diversion just before the flare entrance. It measures only the flow that is diverted into the flare.</p> <p>The flare is used only in case the volume of gas is higher than the amount combusted in the electricity generators. In 15/05/2013, due to lack of sufficient biogas, the flare was temporary turned off and no ERs were claimed due to flaring landfill gas from that day on during this MP.</p> <p>The flow meter used is manufactured by Rosemount. The data is continuous measured, recorded every two minutes and aggregated hourly, monthly and yearly for ER calculations.</p> <p>The flow meter measures the flow in normalized cubic meters per hour (Nm³/h). This is possible as the system executes an automatic calculation taking into consideration measures of pressure and temperature of the landfill gas.</p> <p><i>Verifier's action:</i> During the site visit, the verification team had access to and inspected all equipment and data control system</p> <p><i>Conclusion:</i> The measurement of monitored parameter is in accordance with PDD and applied methodology. It is important to point out that the temporary deviation proposed during this period was applied after the end of flare operations. Thus it does not interfere in this parameter.</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400)</p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p> <p><i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i></p>	/CAL/ /MR/	<p><i>Description:</i> The information of operation and calibration of the instruments were provided by the manufacturer^{/CAL/}.</p> <p>As a biogas safety measure, whenever temperature of the landfill gas reaches above 60°C (140°F), the system is shut down.</p> <p>The temperature and pressure meters used to normalize the biogas flow are calibrated as per manufacturer specification. It was observed that the meters that measure the temperature and pressure for normalize the gas flow presented delays in its calibration. As a conservative measure, the PP considered the flow equal to zero in these periods.</p> <p>The relevant calibration dates of the meters can be observed in appendix 6 of this report and their calibration frequency were evidenced to the verification team.</p> <p><i>Verifier's action:</i> The calibration certificates and statement from manufacturer were reviewed, and compared to information provided in the MR</p> <p><i>Conclusion:</i> The Flow meters are calibrated as per manufacturer which is in accordance with the MP. For the periods when the calibration of temperature probes or the relative pressure probes were delayed, the flow is considered equal to zero. The verification team observed this consideration in the ER spreadsheet and considered this measure conservative.</p>	OK	OK
<p>c) Correctness (VVS, §§ 389-393)</p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i></p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i></p>	/MR/ /RAW/ /CAL/	<p><input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i> The verification team has checked the raw data^{/RAW/} stored in the site server directly from the PLC system against the LFG values applied in the ER calculation spreadsheet and all data was found correct. No discrepancies or mistakes have been identified.</p> <p><i>Verifier's action:</i> the value has been reviewed during the site visit by cross-checking the data records stored in the site server directly from the data control system (PLC) with corresponding</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>		ER spreadsheets. Calibration certificates ^{/CAL/} were also checked by the verification team. <i>Conclusion:</i> The values given in the monitoring report are considered correct and determined conservatively by verification team.		
A.3. LFG_{electricity,y}		Amount of Landfill gas combusted in power plant		
a) Measurement / Determination method (VVS, §§ 389-393) Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.	/IM01/ /MR/	<i>Description:</i> The parameter is measured by a flow-meter, installed before just before the electricity generators, after the diversion with the flare. The flow is then added in the ER calculation spreadsheet. The flow meter used is manufactured by Rosemount. The data is continuous measured, recorded every two minutes and aggregated hourly, monthly and yearly for ER calculations. The flow meter measures the flow in normalized cubic meters per hour (Nm ³ /h). This is possible as the system executes an automatic calculation taking into consideration measures of pressure and temperature of the landfill gas. <i>Verifier's action:</i> During the site visit, the verification team had access to and inspected all equipment and data control system <i>Conclusion:</i> during the monitoring period, in the whole month of January 2014 and from October 2014 until the end of the period, the supervisory system suffered an outage and no flow data was recorded. Thus, the PP applied a temporary deviation for this period in order to calculate the Emission Reductions, which was approved by the board on 04/04/2017 under the PRC-3464-002. Refer to CL 01.	CL-01	OK
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance	/IM01/ /CAL/ /MR/	<i>Description:</i> The information of operation and calibration of the instruments were provided by the manufacturer ^{/CAL/} . The temperature and pressure meters used to normalize the biogas flow are calibrated as per manufacturer specification.	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p> <p><i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i></p>		<p>The relevant calibration dates of the meters can be observed in appendix 6 of this report</p> <p><i>Verifier's action:</i> The calibration certificates and statement from manufacturer were reviewed, and compared to information provided in the MR</p> <p><i>Conclusion:</i> The Flow meters are calibrated as per manufacturer which is in accordance with the MP. For the periods when the calibration of temperature probes or the relative pressure probes or the differential pressure sensor were delayed, the flow is considered equal to zero. The verification team observed this consideration in the ER spreadsheet.</p>		
<p>c) Correctness (VVS, §§ 389-393)</p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i></p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>	<p>/MR/ /XLS/ /RAW/</p>	<p><input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i> The verification team has checked the raw data^{/RAW/} stored on site server directly from the PLC system against the LFG values applied in the ER calculation spreadsheet and all measured data was found correct. No discrepancies or mistakes have been identified. Please refer to CL 01 regarding the missing data.</p> <p><i>Verifier's action:</i> the value has been reviewed during the site visit by cross-checking the data records stored in the data control system (PLC) at the site with corresponding ER spreadsheets. Calibration certificates^{/CAL/} were also checked by the verification team.</p> <p><i>Conclusion:</i> The values given in the monitoring report are considered correct and determined conservatively by verification team. It is important to point out that during the monitoring period, in the whole month of January 2014 and from October 2014 until the end of the period, the supervisory system suffered an outage and no flow data was recorded. Thus, the PP applied a temporary deviation for this period in order to calculate the Emission Reductions, which was approved by the board on 04/04/2017 under the PRC-3464-002. Refer to CL 01 above.</p>	<p>CL-04</p>	<p>OK</p>

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
A.4. $w_{CH_4,y}$		Methane fraction in the landfill gas		
<p>a) Measurement / Determination method (VVS, §§ 389-393) Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</p>	<p>/IM01/ /PDD/ /ACM01/ /TECH/</p>	<p><i>Description:</i> The parameter is measured as per methodology ACM0001 Version 11 by a gas analyser installed in the main pipe before the diversion into electricity generators and flare.</p> <p>The gas is measured continuously every two minutes and aggregated to perform the calculations.</p> <p><i>Verifier's action:</i> during the site visit the verification team had access to all equipment and data control system. Also, the operational procedures have been reviewed in order to verify the installation/replacement records of the gas analyzers.</p> <p><i>Conclusion:</i> The parameter was measured as per registered monitoring plan and it is in line with applied methodology. However, during the monitoring period, in the whole month of January 2014 and from October 2014 until the end of the period, the supervisory system suffered an outage and no methane data was recorded. Thus, the PP applied a temporary deviation for this period in order to calculate the Emission Reductions, which was approved by the board on 04/04/2017 under the PRC-3464-002. Refer to CL 01 above.</p>	CL-04	OK
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs. Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</p>	<p>/CAL/ /TECH/ /TRAIN/</p>	<p><i>Description:</i> The gas analyser is subject to regular maintenance and testing. The manufacturer recommends between six and twelve months calibration frequency depending on the application. As an internal procedure, the PP adopted the regular calibration regime made internally. The PP decided to calibrate the gas meter every month, which is even more precise than required by the monitoring plan, which states six months calibration frequency. The calibration dates are described in Appendix 6 of this report. .</p> <p>The record of operation and calibration of the instruments is well established in the company's internal procedures^{/CAL/}.</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i>		<p>The calibration is performed internally by trained personnel. Training certificates were provided to and verified by the verification team.</p> <p>The relevant calibration dates of the gas analyzer can be observed in the appendix 6 of this report.</p> <p><i>Verifier's action:</i> Interviews with company personnel were performed, calibration certificates, the equipment operational manual and training certificates were reviewed.</p> <p><i>Conclusion:</i></p> <p>The equipment is duly calibrated as per registered monitoring plan and manufacturer's specifications, which state that the equipment's accuracy will be checked at least every six months. In order to be more precise, the PP adopted monthly calibration regime. Even though the PP missed the calibration for the month September/2015, the practice is still in accordance with the monitoring plan and manufacturer's. Furthermore, this delay occurred during the temporary deviation approved (PRC-3464-002). During this period, an estimated value was applied to this parameter. Thus, no reduction of accuracy can be attributed to the measurement's result during this month.</p>		
<p>c) Correctness (VVS, §§ 389-393)</p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i></p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>	<p>/MR/ /XLS/ /TECH/ /RAW/ /CAL/</p>	<p><input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i> The parameter is measured using a gas analyzer every two minutes. The data is obtained from PLC software which is the software responsible for aggregation of all monitoring data.</p> <p><i>Verifier's action:</i> the values have been reviewed during the site visit by cross-checking the data records stored in the site server directly from the data control system PLC against the corresponding ER spreadsheets. Calibration certificates^{/CAL/} were also checked by the verification team.</p> <p><i>Conclusion:</i> The measured data was duly reported and correctly applied in the ER calculations. However, during the monitoring</p>	CL-1	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		period, in the whole month of January 2014 and from October 2014 until the end of the period, the supervisory system suffered an outage and no methane data was recorded. Thus, the PP applied a temporary deviation for this period in order to calculate the Emission Reductions, which was approved by the board on 04/04/2017 under the PRC-3464-002. Refer to CL 01 above.		
A.5. -		Description: Operation of the energy plant in an year y		
<p>a) Measurement / Determination method (VVS, §§ 389-393) <i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</i> <i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i> <i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	/RAW/	<p><i>Description:</i> The operation of the energy plant is measured directly by a count meter and made available in the company's supervisory^{/RAW/}. The system automatically accounts for the period when the generators are operating. During the site visit it has been observed that in the period between April/2014 and September/2014 no records have been reported in the MR and ER calculations. Thus a CL has been raised.</p> <p><i>Verifier's action:</i> During the site visit, the verification team had access to and verified all equipment and data control system.</p> <p><i>Conclusion:</i> (CL 6) <i>According to the information provided in the MR section D.2 parameter "Operation of the energy plant", from 01/10/2014 onwards the engine's working hours could not be registered. However, no information has been reported in the MR and/or ER calculations spreadsheet from May/2014 on. For that reason, it is not clear whether the applied methodology pg 9 is correctly followed as "The working hours of the energy plant(s) and the boiler(s)/air heater(s)/heat generating equipment(s) should be monitored and no emission reduction could be claimed for methane destruction in the energy plant or the boiler/air heater/heat generating equipment during non-operational hours."</i></p>	CL-6	OK
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400)</p>	/PRO/	<p><i>Description:</i> According to the registered PDD, QA/QC procedures are to be applied as per manufacturer's recommendations. No</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p> <p><i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i></p>		<p>calibration is needed. The system accounts the minutes which the generator is operating.</p> <p><i>Verifier's action:</i> Interview to operators and management manual were checked. .</p> <p><i>Conclusion:</i> The parameter is measured in accordance with applied methodology and registered PDD.</p>		
<p>c) Correctness (VVS, §§ 389-393)</p> <p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i></p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>		<p><input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i> The parameter is constantly measured using a count meter and recorded in the PLC supervisory.</p> <p><i>Verifier's action:</i> the values have been reviewed during the site visit by cross-checking the data records stored in the site server directly from the data control system PLC against electricity generation information.</p> <p><i>Conclusion:</i> The measured data was duly reported in the MR. However, during the monitoring period, in the whole month of January 2014 and from October 2014 until the end of the period, the supervisory system suffered an outage and no data was recorded. Thus, the PP applied a temporary deviation for this period in order to calculate the Emission Reductions, which was approved by the board on 04/04/2017 under the PRC-3464-002. Refer to CL 01 above.</p> <p>Regarding the issue of missing records, refer to CL 6 above.</p>	CL-04 CL-6	OK
A.6. EL_{LFG}		Description: Net amount of electricity generated using LFG		

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p>a) Measurement / Determination method (VVS, §§ 389-393) Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</p>	/PRO/ /MR/ /PDD/ /ELEC/ /PRO/	<p><i>Description:</i> The electricity generated by the project activity is measured by a bidirectional electricity meter which is under responsibility of Energy Company CEMIG. This meter is directly used for invoicing purposes. The generated electricity is then dispatched to the SIN (National Grid) just outside the company's gates.</p> <p><i>Verifier's action:</i> The verification team had access to the internal procedure ^{/PRO/} regarding electricity metering and the values have been crosschecked with sales receipts.</p> <p><i>Conclusion:</i> The parameter is measured in accordance with applied methodology and registered PDD and follows the national regulations^{/PRO/}.</p>	OK	OK
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs. Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance. Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</p>	/PRO/ /CAL/	<p><i>Description:</i> The electricity meter is sealed and is under responsibility of Energy Company CEMIG. They are responsible for maintenance and metering. The initial calibration was performed by CEMIG as per national regulations^{/PRO/} and it is outside of PP's control. [/]. According to email provided by CEMIG^{/CAL/}, there is no need of further calibrations after the initial one.</p> <p><i>Verifier's action:</i> The verification team had access to and reviewed the internal procedure^{/PRO/} regarding electricity metering, the ONS procedure regarding meters maintenance and email^{/CAL/} provided by CEMIG regarding the meter calibration.</p> <p><i>Conclusion:</i> The parameter receives maintenance as per national regulations. The same data used by the PP to calculate the ER is used for invoicing purposes (official data). Thus, the verification team agrees that the parameter is measured and cross-checked as per registered PDD.</p>	OK	OK
<p>c) Correctness (VVS, §§ 389-393)</p>	/ELEC/ /RAW/	<input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment)	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i></p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>		<p><i>Description:</i> The electricity measured data is directly sent to CCEE (public company) without PP's interference. CCEE is the government company responsible for data treatment and energy accounting in Brazil. The PP have access to the raw data through a chriptographed password. Data is also aggregated by CCEE hourly, daily and monthly. The monthly data is used for invoicing purposes and for ER calculations. It is national official data. The parameter is measured as per description in PDD. The company's software receives also the signal from electricity meter which is accounted in the supervisory.^{/RAW/}. Data stored in the database diretly from supervisory was cross-checked against CCEE reports and electricity receipt of sales.</p> <p>No inconsistency was observed.</p> <p><i>Verifier's action:</i> Data used in the calculations and reported in the MR were cross checked with to the CCEE reports which is the national official data for energy transactions between generators, transmitters and distributors.</p> <p><i>Conclusion:</i> The parameter is correctly reported and no discrepancies were observed during the monitoring period.</p>		
A.7. EL_{PR,y}		Total amount of electricity imported to meet the requirements of the Project		
<p>a) Measurement / Determination method (VVS, §§ 389-393)</p> <p><i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination</i></p>	<p>/PRO/ /MR/ /PDD/ /ELEC/ /PRO/</p>	<p><i>Description:</i> The electricity consumed by the project activity is measured by the same bidirectional electricity meter that measures the electricity generated, which is under responsibility of Energy Company CEMIG. The parameter is accounted only by the electricity consumed by the project activity (blowers, chillers, valves, equipment, etc).</p> <p><i>Verifier's action:</i> The verification team had access to and reviewed the internal procedure ^{/PRO/} regarding electricity metering and the values have been crosschecked with sales receipts.</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i>		<i>Conclusion:</i> The parameter is measured in accordance with applied methodology and registered PDD and follows the national regulations ^{/PRO/} .		
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i> <i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i> <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i>	/CAL/ /PRO/ /IM01/	<i>Description:</i> Electricity meter will be subject to regular maintenance and testing in accordance with suppliers recommendations. It was observed that during the monitoring period the meter has not been exchanged. The relevant calibration dates of the meter can be observed in the appendix 6 of this report. The initial calibration was performed by CEMIG as per national regulations ^{/PRO/} and it is outside of PP's control. [/] . According to email provided by CEMIG ^{/CAL/} , there is no need of further calibrations after the initial one. <i>Verifier's action:</i> calibration certificates of the equipment were checked and interviews were performed with company's personnel. Internal procedures were reviewed. Furthermore, email from CEMIG was checked. <i>Conclusion:</i> The electricity meters are duly calibrated and follow national regulation ^{/PRO/} and CEMIG's procedure, which is in accordance with monitoring plan and internal procedure.	OK	OK
c) Correctness (VVS, §§ 389-393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i>	/ELEC/ /CCEE/ /RAW/	<input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment) <i>Description:</i> The electricity measured is directly sent to CCEE (public company) without PP's interference. They are responsible for data treatment and energy account in Brazil. The PP have access to the raw data through a chriptographed password. Data is also aggregated by CCEE hourly, daily and monthly. The monthly data is used for Project Emission calculations. It is national official data. The parameter is measured as per description in PDD. The company's software receives also the signal from electricity meter which is accounted in the	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>		<p>supervisory^{/RAW/}. Data stored in the database directly from supervisory was cross-checked against electricity invoices (receipt of sales)^{/ELEC/}</p> <p>No inconsistency was observed.</p> <p><i>Verifier's action:</i> Data used in the calculations and reported in the MR were cross checked to the CCEE reports which is national official data for energy transactions between generators, transmitters and distributors and with electricity invoices.</p> <p><i>Conclusion:</i> The parameter is correctly reported and no discrepancies were observed during the monitoring period.</p>		
A.8. CEF_{ELEC,BL,y}		Carbon Emission Factor for electricity		
<p>a) Measurement / Determination method (VVS, §§ 389-393)</p> <p><i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	<p>/IM01/ /PDD/ /ACM01/ /TOOL/</p>	<p><i>Description:</i> The parameter was calculated based on the "Tool to calculate the emission factor for an electricity system"^{/TOOL/}, version 2.0 using the published data by the Brazilian DNA^{/dna/} for values EF_{OM,grid} and EF_{BM,grid}.</p> <p>According to the applied methodology, this parameter is used to calculate the baseline emissions through displacing electricity from the grid.</p> <p>Data of EF_{OM} and EF_{BM} are directly obtained from Brazilian DNA^{/dna/}, on a yearly basis.</p> <p>The parameter is then calculated using the following formula:</p> $CEF_{elec,BL,y} = EF_{OM} \times w_{OM} + EF_{BM} \times w_{BM}$ <p><i>Verifier's action:</i> The Monitoring Plan and related tools were reviewed and information was cross-checked with excel calculations.</p> <p><i>Conclusion:</i> The parameter is used for its right purpose as per applied methodology, which is calculate the Emission Factor of the electricity exported to the grid. However the verification team observed that the PP did not apply the latest available data set for CEF calculations. Thus a CAR has been raised.</p>	CAR 04	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		(CAR 01) <i>The data set used for calculation of the EF_{grid} and $CEF_{elec,BL}$ is not the latest available for the year 2015.</i>		
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i> <i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i> <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i>	/dna/ /XLS/ /PDD/	<p><i>Description:</i> The official data were cross-checked against the Brazilian DNA website as well as the parameter calculations yearly.</p> <p><i>Verifier's action:</i> The Monitoring Plan and related tools were reviewed and information was cross-checked with excel calculations</p> <p><i>Conclusion:</i> The PP observed that QA/QC procedures were applied as per monitored plan.</p>	N/A	N/A
c) Correctness (VVS, §§ 389-393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i> <i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/MR/ /TOOL/ /dna/	<p> <input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct </p> <p><i>Description:</i> data of EF_{OM} and EF_{BM} were directly obtained from Brazilian DNA^{/dna/}.</p> <p>The formula used for the calculation is:</p> $CEF_{elec,BL,y} = EF_{OM} \times w_{OM} + EF_{BM} \times w_{BM}$ <p>The values used for both parameters w_{OM} and w_{BM} are 0.5. according to "Tool to calculate an emission factor for an electricity system".</p> <p><i>Verifier's action:</i> Excel calculations and related tools were checked for verification of this information.</p> <p><i>Conclusion:</i> However, the verification team observed that the Brazilian DNA had just released the updated 2015 data. Thus a CAR has been raised. Please refer to CAR 01 above.</p>	CAR 01	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
A.9. PE_{EC,y}		Project emissions from electricity consumption by the project activity during year y		
<p>a) Measurement / Determination method (VVS, §§ 389-393) Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</p>	<p>/IM01/ /MR/ /PDD/ /ACM01/ /TOOL/</p>	<p><i>Description:</i> Project emissions from electricity consumption were calculated as per “Tool to calculate baseline, project and/or leakage emissions from electricity consumption”^{/TOOL/}, using the formula below:</p> $PE_{EC,y} = \sum_j EC_{PJ,j,y} \times EF_{CM,j,y} \times (1 + TDL_{j,y})$ <p>To have access to the necessary parameters for this calculation, please refer to EC_{PJ,j,y} and EF_{CM,j,y} and TDL_{j,y} in this verification report.</p> <p>The electricity consumption is measured continuously by the electricity meter. The parameter PE_{EC,y} is calculated monthly.</p> <p><i>Verifier's action:</i> The information contained in the methodology was cross-checked with information from PDD.</p> <p><i>Conclusion:</i> Parameter is calculated in accordance with applied tools and methodology and it is in accordance with registered PDD</p>	OK	OK
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs. Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the</p>	<p>/XLS/ /PDD/ /TOOL/</p>	<p><i>Description:</i> The data is calculated as per Tool to calculate baseline, project and/or leakage emissions from electricity consumption”^{/TOOL/}. Internal audits are performed to ensure the correctness of the calculation.</p> <p><i>Verifier's action:</i> The verification team observed that constantly the calculations are reviewed and audited by the PPs.</p> <p><i>Conclusion:</i> The Verification Team observed that QA/QC procedures were applied as per monitored plan.</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>monitoring equipment has been carried out in line with the latest EB guidance. Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i>				
c) Correctness (VVS, §§ 389-393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/MR/ /TOOL/	<input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment) <i>Description:</i> Project emissions from electricity consumption were calculated as per "Tool to calculate baseline, project and/or leakage emissions from electricity consumption" ^{TOOL} , using the formula cited above. <i>Verifier's action:</i> The calculation presented in the excel spreadsheet was cross-checked with information provided in the PDD. <i>Conclusion:</i> the parameter is calculated as per applied electricity and no inconsistency was observed in its calculation.	OK	OK
A.10. TDL_{j,y}		Average technical transmission and distribution losses for providing electricity to source j in year y		
a) Measurement / Determination method (VVS, §§ 389-393) <i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i>	/IM01/ /MR/ /PDD/ /ACM01/ /TOOL/	<i>Description:</i> According to the registered PDD, the parameter is either obtained from official sources or a default value is applied conservatively. The PP chose to apply the default value for this parameter as per registered PDD and applied tool. <i>Verifier's action:</i> the default value was checked against the applied tool <i>Conclusion:</i> The parameter was determined conservatively and it is in accordance with registered PDD.	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i> <i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i> <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i>	/XLS/ /PDD/ /TOOL/	<p><i>Description:</i> As no public data is available, the PP chose applying the default data stated in the tool Tool to calculate baseline, project and/or leakage emissions from electricity consumption^{"/TOOL/}. Internal audits are performed to ensure the conservativeness of the parameter.</p> <p><i>Verifier's action:</i> The verification team checked the applied tool and search for public information available.</p> <p><i>Conclusion:</i> The Verification team observed that QA/QC procedures were applied as per monitored plan.</p>	OK	OK
c) Correctness (VVS, §§ 389-393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i> <i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/MR/ /TOOL/	<p><input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment)</p> <p><i>Description:</i> Parameter is obtained conservatively as a default.</p> <p><i>Verifier's action:</i> The verification team checked the applied tool and search for public information available.</p> <p><i>Conclusion:</i> Parameter is chosen correctly and conservatively.</p>	OK	OK
A.11. EF_{CM,y}		Combined margin emissions factor required to evaluate CO2 emissions due to the power consumption of the project activity imported from the National Grid		
a) Measurement / Determination method (VVS, §§ 389-393)	/IM01/ /PDD/ /ACM01/	<p><i>Description:</i> The parameter was calculated based on the "Tool to calculate the emission factor for an electricity system^{"/TOOL/},</p>	CAR 01	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i></p> <p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	/TOOL/	<p>version 2.0 using the published data by the Brazilian DNA^{/dna/} for values EF_{OM,grid} and EF_{BM,grid}.</p> <p>According to the applied methodology and registered PDD, this parameter is used to calculate the project emissions for electricity consumption.</p> <p>Data of EF_{OM} and EF_{BM} are directly obtained from Brazilian DNA^{/dna/}, on a yearly basis.</p> <p>The parameter is then calculated using the following formula:</p> $EF_{CM,y} = EF_{OM} \times w_{OM} + EF_{BM} \times w_{BM}$ <p><i>Verifier's action:</i> The Monitoring Plan and related tools were reviewed and information was cross-checked with excel calculations.</p> <p><i>Conclusion:</i> The parameter is used for its right purpose as per applied methodology, which is calculate the Emission Factor of the electricity imported from the grid. However the verification team observed that the PP did not applied the latest available data for its calculations. Thus a CAR has been raised.</p> <p>(CAR 01) <i>The data set used for calculation of the EF_{grid} and CEF_{elect,BL} is not the latest available for the year 2015.</i></p>		
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400)</p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the</i></p>	<p>/dna/ /XLS/ /PDD/</p>	<p><i>Description:</i> The official data were checked in the Brazilian DNA website as well as the parameter calculations yearly.</p> <p><i>Verifier's action:</i> The Monitoring Plan and related tools were reviewed and information was cross-checked with excel calculations</p> <p><i>Conclusion:</i> The PP observed that QA/QC procedures were applied as per monitored plan.</p>	N/A	N/A

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>monitoring equipment has been carried out in line with the latest EB guidance. Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i>				
c) Correctness (VVS, §§ 389-393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/MR/ /TOOL/ /dna/	<input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct <i>Description:</i> data of EF _{OM} and EF _{BM} were directly obtained from Brazilian DNA ^{/dna/} . The formula used for the calculation is: $EF_{CM,y} = EF_{OM} \times w_{OM} + EF_{BM} \times w_{BM}$ The values used for both parameters w _{OM} and w _{BM} are 0.5. according to "Tool to calculate an emission factor for an electricity system". <i>Verifier's action:</i> Excel calculations and related tools were checked for verification of this information. <i>Conclusion:</i> However, the verification team observed that the Brazilian DNA had just released the updated 2015 data. Thus a CAR has been raised. Please refer to CAR 01 above.	CAR 01	OK
A.12. fv_{i,h}		Volumetric fraction of component i in the residual gas in the hour h where i = CH₄, CO, CO₂, O₂, H₂, N₂		
a) Measurement / Determination method (VVS, §§ 389-393) <i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination</i>	/IM01/ /PDD/ /ACM01/ /TECH/	<i>Description:</i> According to the applied tool, this parameter is the same as the parameter w _{CH4} . The parameter is measured as per applied tool by a gas analyser installed in the main pipe before the diversion into electricity generators and flare. The gas is measured continuously every two minutes and aggregated to perform the calculations. <i>Verifier's action:</i> during the site visit the verification team had access to all equipment and data control system. Also, the	GL-01	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i>		<p>operational procedures have been reviewed in order to verify the installation/replacement records of the gas analyzers.</p> <p><i>Conclusion:</i> The parameter was measured as per registered monitoring plan and it is in line with applied methodology. However, during the monitoring period, in the whole month of January 2014 and from October 2014 until the end of the period, the supervisory system suffered an outage and no methane data was recorded. Thus, the PP applied a temporary deviation for this period in order to calculate the Emission Reductions, which was approved by the board on 04/04/2017 under the PRC-3464-002. Refer to CL 01 above.</p>		
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400)</p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p> <p><i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i></p>	/CAL/ /TECH/ /TRAIN/	<p><i>Description:</i> The gas analyser is subject to regular maintenance and testing. The manufacturer recommends between six and twelve months calibration frequency depending on the application. As an internal procedure, the PP adopted the regular calibration regime made internally. The PP decided to calibrate the gas meter every month, which is even more precise than required by the monitoring plan, which states six months calibration frequency. The calibration dates are described in Appendix 6 of this report. The calibration frequency was evidenced at manufacturer's manual.</p> <p>The record of operation and calibration of the instruments is well established in the company's internal procedures^{/CAL/}.</p> <p>The calibration is performed internally by trained personnel. Training certificates were provided to verification team.</p> <p><i>Verifier's action:</i> Interviews with company personnel were performed, calibration certificates, the equipment operational manual and training certificates were observed.</p> <p><i>Conclusion:</i></p> <p>The equipment is duly calibrated as per registered monitoring plan and manufacturer's specifications, which state that the equipment's accuracy will be checked at least every six months.</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		In order to be more precise, the PP adopted monthly calibration regime. Even though the PP missed the calibration for the month September/2015, the practice is still in accordance with the monitoring plan and manufacturer's. Furthermore, this delay occurred during the temporary deviation approved (PRC-3464-002). During this period, an estimated value was applied to this parameter. Thus, no reduction of accuracy can be attributed to the measurement's result during this month.		
c) Correctness (VVS, §§ 389-393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i> <i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/MR/ /XLS/ /TECH/ /RAW/ /CAL/	<input type="checkbox"/> Correct <input checked="" type="checkbox"/> Not correct (initial assessment) <i>Description:</i> The parameter is measured using a gas analyzer every two minutes. The data is obtained from PLC software responsible for aggregation of all monitoring data. <i>Verifier's action:</i> the values have been reviewed during the site visit by cross-checking the data records stored on site server directly from data control system PLC against corresponding ER spreadsheets. Calibration certificates ^{CAL} were also checked by the verification team. <i>Conclusion:</i> The measured data was duly reported and correctly applied in the ER calculations. However, during the monitoring period, in the whole month of January 2014 and from October 2014 until the end of the period, the supervisory system suffered an outage and no methane data was recorded. Thus, the PP applied a temporary deviation for this period in order to calculate the Emission Reductions, which was approved by the board on 04/04/2017 under the PRC-3464-002. Refer to CL 01 above.	CL-01	OK
A.13. t_{O2,h}		Description: Volumetric fraction of O₂ in the exhaust gas of the flare on web basis in the hour h		
a) Measurement / Determination method (VVS, §§ 389-393) <i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data</i>	/PDD/ /ACM01/ /TECH/ /MT/	<i>Description:</i> A gas analyser is used to measure the exhaust gas composition in the flare. The period of measurement is within the required by applied tool. (measurements are made in an interval of two minutes whilst the tool requires hourly aggregation).	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>aggregation trails (from ODL to data aggregation level zero (DAL0)).</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>		<p>The model of gas analyser is Ultramat 23. The monitoring of this parameter is continuous due to continuous monitoring of the flare efficiency.</p> <p>The measure data was direct sent to the PLC system.</p> <p>The meter is calibrated as per manufacturer's recommendation.</p> <p><i>Verifier's action:</i> The equipment was checked during the site visit and data from equipment was visualized in the PLC supervisory.</p> <p><i>Conclusion:</i> The measurement/determination method is in line with registered monitoring plan according to the verification team. It is important to point out that the flare was shut down in 15/05/2013 due to lack of gas. Only the electricity generators received landfill gas from this time on.</p>		
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400)</p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p> <p><i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i></p>	/CAL/	<p><i>Description:</i> The gas analyser is subject to regular maintenance and testing. The manufacturer recommends between six and twelve months calibration frequency depending on the application. As an internal procedure, the PP adopted the regular calibration regime made internally. The PP decided to calibrate the gas meter every month, which is even more precise than required by the monitoring plan, which states six months calibration frequency. The calibration dates are described in Appendix 6 of this report. The calibration applied attends the monitoring plan and manufacturer's specifications.</p> <p><i>Verifier's action:</i> Interviews with personnel were performed and the calibration certificates were checked.</p> <p><i>Conclusion:</i></p> <p>No delays in calibration were observed for the equipment that measures this parameter. All QA/QC procedures were duly applied.</p>	OK	OK
<p>c) Correctness (VVS, §§ 389-393)</p>	/MR/ /XLS/	<p><input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment)</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i></p> <p><i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i></p> <p><i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i></p>	/RAW/ /TECH/	<p><i>Description:</i> The values measured by gas analyser are directly sent to the PLC system. The values in the software were cross-checked with data described in the excel spreadsheet.</p> <p><i>Verifier's action:</i> Values provided in the excel spreadsheet were cross-checked with data registered in site server directly from PLC System. Furthermore, technical specifications of the gas analyser were checked.</p> <p><i>Conclusion:</i> Parameter is measured as per applied tool. No inconsistencies were observed.</p>		
A.14. $f_{v_{CH_4,FG,h}}$		Concentration of methane in the exhaust gas of the flare in dry basis at normal conditions in the hour h		
<p>a) Measurement / Determination method (VVS, §§ 389-393)</p> <p><i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>	/PDD/ /ACM01/ /TECH/ /MT/	<p><i>Description:</i> A gas analyser is used to measure the exhaust gas composition in the flare. The period of measurement is within the required by applied tool. (measurements are made in an interval of two minutes whilst the tool requires hourly aggregation).</p> <p>The model of gas analyser is Ultramat 23. The monitoring of this parameter is continuous due to continuous monitoring of the flare efficiency.</p> <p>The measure data was direct sent to the PLC system.</p> <p>The meter is calibrated as per manufacturer's recommendation.</p> <p><i>Verifier's action:</i> The equipment was checked during the site visit and data from equipment was visualized in the PLC supervisory.</p> <p><i>Conclusion:</i> The measurement/determination method is in line with registered monitoring plan according to the verification team. It is important to point out that the flare was shut down in 15/05/2013 due to lack of gas. Only the electricity generators received landfill gas from this time on.</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
b) Accuracy and QA/QC Procedure (VVS, §§ 394-400) <i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i> <i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i> <i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i>	/CAL/	<i>Description:</i> The calibration frequency is determined by the manufacturer. No calibration delay has been observed. <i>Verifier's action:</i> Interviews with personnel were performed and the calibration certificates were checked. <i>Conclusion:</i> No delays in calibration were observed for the equipment that measures this parameter. All QA/QC procedures were duly applied.	OK	OK
c) Correctness (VVS, §§ 389-393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i> <i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/MR/ /XLS/ /RAW/ /TECH/	<input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment) <i>Description:</i> The values measured by gas analyser are directly sent to the PLC system. The values in the software were cross-checked with data described in the excel spreadsheet. <i>Verifier's action:</i> Values provided in the excel spreadsheet were cross-checked with data stored in site server directly from in PLC System. Furthermore, technical specifications of the gas analyser were checked. <i>Conclusion:</i> Parameter is measured as per applied tool. No inconsistencies were observed.	OK	OK
A.15. T_{flare}		Temperature in the exhaust gas of the enclosed flare		
a) Measurement / Determination method (VVS, §§ 389-393) <i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original</i>	/PDD/ /ACM01/ /TOOL/	<i>Description:</i> The data is measured continuously (average value in a time interval every two minute). It is used to validate if the flare is within the working range and to attest the continuous monitoring condition of the flare.	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)).</i></p> <p><i>Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>		<p>The flare system installed in the Project activity have a high performance automatic system for control the flare temperature composed by one thermocouple, located at 80% of the flare high as required by applied tool.</p> <p>According to the applicable tool "Tool to determine project emissions from flaring gases containing methane" this parameter should be measured with thermocouples type N. The type S thermocouple was installed in the flare which is considered more robust for this type of process.</p> <p><i>Verifier's action:</i> The equipment was observed during the site visit, and interviews were performed to company's personnel. The verification team expertise was considered in the differentiation of both thermocouples (Type N and Type S).</p> <p><i>Conclusion:</i> The measurement of the monitoring parameter is in line with registered monitoring plan and applied methodology.</p>		
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400)</p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p> <p><i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i></p>	/CAL/ /TECH/	<p><i>Description:</i> The equipment is calibrated as per applied tool.</p> <p>The information of equipment exchange and relevant calibration data can be observed in reference table and Appendix 6 of this report:</p> <p><i>Verifier's action:</i> Calibration certificates were checked and interviews were performed to company's personnel.</p> <p><i>Conclusion:</i> The equipment was considered accurate for the correct determination of the parameter. The calibration frequency is following the applied tool and is in accordance with monitoring plan.</p>	OK	OK
c) Correctness	/MR/	<input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment)	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p>(VVS, §§ 389-393) Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</p>	/RAW/ /CAL/ /TECH/	<p><i>Description:</i> The calibration frequency is in accordance with the “tool to determine project emissions from flaring gases containing methane” EB28 annex 13. The values of T_{flare} were determined in a conservative manner. No delays in calibration were observed during the monitoring period</p> <p><i>Verifier's action:</i> the value has been reviewed during the site visit by cross-checking the data records^{/RAW/} stored in the site server directly from data control system (PLC) at the site with corresponding ER spreadsheets. Calibration certificates^{/CAL/} were also checked by the verification team.</p> <p><i>Conclusion:</i> The values of this parameter were determined in a conservative manner during the period.</p>		
A.16. $PE_{flare,y}$		Project Emissions from flaring of the residual gas stream in year y		
<p>a) Measurement / Determination method (VVS, §§ 389-393) Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements. Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</p>	/IM01/ /PDD/ /ACM01/ /TOOL/	<p><i>Description:</i> The calculation of this parameter is based on the efficiency of the flare. According to the registered MP and the applicable methodology project emissions from flaring shall be calculated as per the “Tool to determine project emissions from flaring gases containing methane” EB28 Annex13^{/MT/} as follows:</p> <ul style="list-style-type: none"> - Determination of the mass flow rate of the residual gas that is flared - Determination of the mass fraction of carbon, hydrogen, oxygen and nitrogen in the residual gas - Determination of the volumetric flow rate of the exhaust gas on a dry basis - Determination of methane mass flow rate of the exhaust gas on a dry basis - Determination of methane mass flow rate of the residual gas on a dry basis - Determination of the hourly flare efficiency 	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<p>- Calculation of annual project emissions from flaring based on measured hourly values or based on default flare efficiencies.</p> <p>As the project activity is a landfill gas project, parameters $FV_{RG,h}$ and $f_{VCH4,RGh}$ correspond to $LFG_{flare,y}$ and w_{CH4} respectively. Parameter $\eta_{flare,h}$ is determined based on the parameters $TM_{FG,h}$ and $TM_{RG,h}$ (methane mass flow rate in the exhaust and residual stream respectively)</p> <p>The verification team has checked these considerations against the applied methodology ACM0001 Version 11 and the “<i>Tool to determine project emissions from flaring gases containing methane</i>” and they were found correct. Hence, it is confirmed that the project emissions from flaring are in accordance with the applicable methodology and tool.</p> <p>As this parameter is calculated no measuring equipment is directly related. For the equipment used to monitor parameters $LFG_{flare,y}$, w_{CH4} and T_{flare} please refer to the specific assessment of each parameter included in this Verification Report.</p> <p><i>Verifier’s action:</i> the MP as well as the applicable methodology have been checked by the verification team</p> <p><i>Conclusion:</i> The method of determination of the parameter is in accordance with monitoring plan.</p>		
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400)</p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the</i></p>		<p><i>The project emissions from flaring are calculated as per the “Tool to determine project emissions from flaring gases containing methane” Version 01.</i></p>	<p>OK</p>	<p>OK</p>

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<i>monitoring equipment has been carried out in line with the latest EB guidance. Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i>				
c) Correctness (VVS, §§ 389-393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner. In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given. In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/MR/ /TOOL/	<input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment) <i>Description:</i> the calculation of the project emissions from flaring are detailed in the ER calculation spreadsheet. The verification team has checked the calculation procedure for the project emissions from flaring against the applicable tool ^{/TOOL/} . No inconsistencies were observed when determining parameters that affect the calculation of the PE _{flare,y} . <i>Verifier's action:</i> the ER calculation spreadsheet has been checked by the verification team. <i>Conclusion:</i> The flare efficiency is being calculated as per applied "Tool to determine project emissions from flaring gases containing methane", version 1.	OK	OK
A.17. FV_{RG,h}		Volumetric flow rate of the residual gas in dry basis at normal conditions in the hour h		
a) Measurement / Determination method (VVS, §§ 389-393) <i>Describe how the monitoring parameter was measured / determined. Focus primarily on the original data level (ODL) but also describe the applied data aggregation trails (from ODL to data aggregation level zero (DAL0)). Check if relevant equipment has been exchanged and if in cases of failures / downtimes of standard equipment other measurement / determination methods have been used. Furthermore, verify the frequency of measurements as per the requirements.</i>	/IM01/ /PDD/ /ACM01/	<i>Description:</i> This parameter is the same as the LFG _{flare,y} . The parameter is measured by one flow-meter installed after the pipe diversion just before the flare entrance. It measures only the flow that is diverted into the flare. The flare is used only in case the volume of gas is higher than the amount combusted in the electricity generators. In 15/05/2013, due to lack of sufficient biogas, the flare was temporary turned off and no ERs were claimed due to flaring landfill gas from that day on during this MP.	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
<p><i>Assess whether the measurement / determination method is in line with the registered monitoring plan of the PDD and the applied methodology.</i></p>		<p>The flow meter used is manufactured by Rosemount. The data is continuous measured, recorded every two minutes and aggregated hourly, monthly and yearly for ER calculations.</p> <p>The flow meter measures the flow in normalized cubic meters per hour (Nm³/h). This is possible as the system executes an automatic calculation taking into consideration measures of pressure and temperature of the landfill gas.</p> <p><i>Verifier's action:</i> During the site visit, the verification team had access to and verified all equipment and data control system</p> <p><i>Conclusion:</i> The measurement of monitored parameter is in accordance with PDD and applied methodology. It is important to point out that the temporary deviation proposed during this period was applied after the end of flare operations. Thus it does not interfere in this parameter.</p>		
<p>b) Accuracy and QA/QC Procedure (VVS, §§ 394-400)</p> <p><i>In case of measured (or estimated) values, check whether the accuracy of equipment used for monitoring is controlled and calibrated in accordance with the monitoring plan or if significant inaccuracies occur; in this case, make sure that the most conservative assumptions theoretically possible have been made for calculating ERs.</i></p> <p><i>Describe whether all applicable QA/QC procedures are met. Assess further if the calibration of the monitoring equipment has been carried out in line with the latest EB guidance.</i></p> <p><i>Include calibration dates and information in validity of the installed monitoring equipment in the table in Appendix 6.</i></p>	/CAL/ /MR/	<p><i>Description:</i> The information of operation and calibration of the instruments were provided by the manufacturer^{/CAL/}.</p> <p>As a biogas safety measure, whenever temperature of the landfill gas reaches above 60°C (140°F), the system is shut down.</p> <p>The temperature and pressure meters used to normalize the biogas flow are calibrated as per manufacturer specification. It was observed that the meters that measure the temperature and pressure for normalize the gas flow presented delays in its calibration. As a conservative measure, the PP considered the flow equal to zero in these periods.</p> <p>The relevant calibration dates of the meters can be observed in appendix 6 of this report and their calibration frequency were evidenced to the verification team.</p> <p><i>Verifier's action:</i> The calibration certificates and statement from manufacturer were reviewed, and compared to information provided in the MR</p>	OK	OK

Checklist Item (incl. guidance for the verification team)	Reference	Verification Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.
		<i>Conclusion:</i> The Flow meters are calibrated as per manufacturer which is in accordance with the MP. For the periods when the calibration of temperature probes or the relative pressure probes were delayed, the flow is considered equal to zero. The verification team observed this consideration in the ER spreadsheet and considered this measure conservative.		
c) Correctness (VVS, §§ 389-393) <i>Determine whether the value given in the monitoring report is correct or determined in a conservative manner.</i> <i>In case of conservative approaches used in lieu of the monitoring as per registered MP detailed assessment of the conservativeness of the approach used should be given.</i> <i>In case of mistakes / deviations pl. provide details and descriptions of the CARs raised.</i>	/MR/ /RAW/ /CAL/	<input checked="" type="checkbox"/> Correct <input type="checkbox"/> Not correct (initial assessment) <i>Description:</i> The verification team has checked the raw data ^{/RAW/} stored in site server directly from the PLC system against the LFG values applied in the ER calculation spreadsheet and all data was found correct. No discrepancies or mistakes have been identified. <i>Verifier's action:</i> the value has been reviewed during the site visit by cross-checking the data records stored in the data control system (PLC) at the site with corresponding ER spreadsheets. Calibration certificates ^{/CAL/} were also checked by the verification team. <i>Conclusion:</i> The values given in the monitoring report are considered correct and determined conservatively by verification team.	OK	OK

Appendix 6. Calibration dates and validity of installed monitoring equipment

Table A-6: Periodic Verification Checklist – Calibration details

Monitoring equipment	Related monitoring parameter as per applicable registered monitoring plan	Serial number	Type	Accuracy or accuracy class	Previous calibration (last calibration before start of this monitoring period)	Calibration date(s) during this monitoring period	Validity of calibration(s)	Delay in calibration : yes/no	Period of delayed calibration
Flow meter	LFG _{total,y}	78147	Rosemount 285	+/- 0.25%	12/09/2009	-	11/09/2019	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
	LFG _{flare,y}	78149			12/09/2009		11/09/2019	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
	LFG _{electricity,y}	78151			12/09/2009		11/09/2019	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
Differential pressure sensor	LFG _{total,y}	6409016459	ABB 264 DS	+/- 0.075%	13/07/2011 <i>Replaced on 12/07/2012</i>	-	12/07/2012	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		U319327	Smar LD301D	+/- 0.075%	-	20/06/2012 <i>Replaced on 31/05/2013</i>	19/06/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		6409016459	ABB 264 DS	+/- 0.075%	-	24/04/2013 <i>Replaced on 22/04/2014</i>	23/04/2014	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		6409016455	ABB 264 DS	+/- 0.075%	-	14/04/2014 <i>Replaced on</i>	13/04/2015	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-

						11/03/2015			
		6409016459	ABB 264 DS	+/- 0.075%	-	22/02/2015	21/02/2016	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
Relative pressure probe	LFG _{total,y}	6409016561	ABB 264 HS	+/- 0.075%	23/03/2011 Replaced on 19/03/2012	-	22/03/2012	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		U305351	Smar LD301M	+/- 0.075%	16/05/2011 Replaced on 15/05/2012	-	15/05/2012	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		6409016561	ABB 264 HS	+/- 0.075%	-	11/05/2012 Replaced on 12/03/2013	10/05/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		U305351	Smar LD301M	+/- 0.075%	-	07/08/2012 Replaced on 31/05/2013	06/08/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		6409016561	ABB 264 HS	+/- 0.075%	-	24/04/2013 Replaced on 22/04/2014	23/04/2014	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		6409016558	ABB 264 HS	+/- 0.075%	-	14/04/2014 Replaced on 11/03/2015	13/04/2015	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		6409016561	ABB 264 HS	+/- 0.075%	-	22/02/2015 Replaced on 17/12/2015	21/02/2016	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		U305351	Smar LD301M	+/- 0.075%	-	10/12/2015	09/12/2016	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
Temperature probe	LFG _{total,y}	1028.138141	Ecil Pt-100	0.15°C + 0.002*T	31/03/2011 Replaced on 19/03/2012	-	30/03/2012	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-

		1003.073042	Ecil Pt-100	0.15°C + 0.002*T	-	24/02/2012 Replaced on 14/01/2013	23/02/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		1119.509260	Ecil Pt-100	0.15°C + 0.002*T	-	24/08/2012 Replaced on 28/06/2013	23/08/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		1003.073042	Ecil Pt-100	0.15°C + 0.002*T	-	05/02/2013 Replaced on 11/02/2014	04/02/2014	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	From: 05/02/2014 To: 11/02/2014
		1037.157655	Ecil Pt-100	0.15°C + 0.002*T	-	06/02/2014 Replaced on 11/03/2015	05/02/2015	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	From: 06/02/2015 To: 11/03/2015
		1003.073042	Ecil Pt-100	0.15°C + 0.002*T	-	15/01/2015 Replaced on 17/12/2015	14/01/2016	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		1119.509238	Ecil Pt-100	0.15°C + 0.002*T	-	11/12/2015	10/12/2016	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
Differential pressure sensor	LFG _{flare,y} FV _{RG,h}	6409016458	ABB 264 DS	+/- 0.075%	13/07/2011 Replaced on 05/05/2012	-	12/07/2012	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		6409016455	ABB 264 DS	+/- 0.075%	13/07/2011 Replaced on 12/07/2012	-	12/07/2012	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		U319328	Smar LD301D	+/- 0.075%	-	20/06/2012	19/06/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
Relative pressure probe	LFG _{flare,y} FV _{RG,h}	6409016558	ABB 264 HS	+/- 0.075%	23/03/2011 Replaced on 19/03/2012	-	22/03/2012	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-

		U305353	Smar LD301M	+/- 0.075%	12/05/2011 Replaced on 05/05/2012	-	11/05/2012	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		6410003214	ABB 264 HS	+/- 0.075%	13/07/2011 Replaced on 12/07/2012	-	12/07/2012	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		U318006	Smar LD301M	+/- 0.075%	-	14/05/2012 Replaced on 12/03/2013	13/05/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		U305353	Smar LD301M	+/- 0.075%	-	07/08/2012	06/08/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
Temperature probe	LFG _{flare,y} FV _{RG,h}	1037.157644	Ecil Pt-100	0.15 °C + 0.002*T	14/12/2010 Replaced on 01/12/2011	-	13/12/2011	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		1119.509238	Ecil Pt-100	0.15 °C + 0.002*T	27/06/2011 Replaced on 26/06/2012	-	26/06/2012	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		1037.157644	Ecil Pt-100	0.15 °C + 0.002*T	-	24/02/2012 Replaced on 14/01/2013	23/02/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		1025.128029	Ecil Pt-100	0.15 °C + 0.002*T	-	24/08/2012	23/08/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
Differential pressure sensor	LFG _{electricity,y}	6409016454	ABB 264 DS	+/- 0.075%	13/07/2011 Replaced on 12/07/2012	-	12/07/2012	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-

		U319329	Smar LD301D	+/- 0.075%	-	20/06/2012 Replaced on 31/05/2013	19/06/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		6409016454	ABB 264 DS	+/- 0.075%	-	24/04/2013 Replaced on 25/03/2014	23/04/2014	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		U319329	Smar LD301D	+/- 0.075%	-	20/06/2012 Replaced on 22/04/2014	19/06/2013	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	From: 20/06/2013 To: 22/04/2014
		6409016454	ABB 264 DS	+/- 0.075%	-	14/04/2014 Replaced on 11/03/2015	13/04/2015	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		6409016458	ABB 264 DS	+/- 0.075%	-	22/02/2015	21/02/2016	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
Relative pressure probe	LFG _{electricity,y}	U305352	Smar LD301M	+/- 0.075%	12/05/2011 Replaced on 05/05/2012	-	11/05/2012	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		6409016558	ABB 264 HS	+/- 0.075%	-	18/04/2012 Replaced on 12/03/2013	17/04/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		U305352	Smar LD301M	+/- 0.075%	-	07/08/2012 Replaced on 31/05/2013	06/08/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		6409016558	ABB 264 HS	+/- 0.075%	-	24/04/2013 Replaced on 25/03/2014	23/04/2014	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		U305352	Smar LD301M	+/- 0.075%	-	07/08/2012 Replaced on 22/04/2014	06/08/2013	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	From: 07/08/2013 To: 22/04/2014

		6410003214	ABB 264 HS	+/- 0.075%	-	14/04/2014 <i>Replaced on</i> 11/03/2015	13/04/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		U318006	Smar LD301M	+/- 0.075%	-	22/02/2015 <i>Replaced on</i> 17/12/2015	21/02/2016	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		U305352	Smar LD301M	+/- 0.075%	-	10/12/2015	09/12/2016	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
Temperature probe	LFG _{electricity,y}	1037.157655	Ecil Pt-100	0.15 °C + 0.002*T	14/12/2010 <i>Replaced on</i> 01/12/2011	-	13/12/2011	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		1119.509260	Ecil Pt-100	0.15 °C + 0.002*T	27/06/2011 <i>Replaced on</i> 26/06/2012	-	26/06/2012	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		1037.157655	Ecil Pt-100	0.15 °C + 0.002*T	-	24/02/2012 <i>Replaced on</i> 14/01/2013	23/02/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		1028.137493	Ecil Pt-100	0.15 °C + 0.002*T	-	24/08/2012 <i>Replaced on</i> 28/06/2013	23/08/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		1028.138141	Ecil Pt-100	0.15 °C + 0.002*T	-	05/02/2013 <i>Replaced on</i> 11/02/2014	04/02/2014	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	From: 05/02/2014 To: 11/02/2014
		1037.157644	Ecil Pt-100	0.15 °C + 0.002*T	-	06/02/2014 <i>Replaced on</i> 11/03/2015	05/02/2015	<input type="checkbox"/> No <input checked="" type="checkbox"/> Yes	From: 06/02/2015 To: 11/03/2015
		1028.138141	Ecil Pt-100	0.15 °C + 0.002*T	-	15/01/2015 <i>Replaced on</i> 17/12/2015	14/01/2016	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-

		1028.137493	Ecil Pt-100	0.15 °C + 0.002*T	-	11/12/2015	10/12/2016	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
Gas analyzer	WCH _{4,y} f _{v,i,h} f _{v,CH₄,RG,h}	ULT 01 – N1X6-991	Ultramat 23	+/-1% for the CH ₄ and 0.5% for the O ₂	19/09/2011	-	18/09/2012	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	17/10/2011	16/10/2012	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	16/11/2011	15/11/2012	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	13/12/2011	12/12/2012	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	12/01/2012	11/01/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	10/02/2012	09/02/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	09/03/2012	08/03/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	06/04/2012	05/04/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	04/05/2012	03/05/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-

					-	01/06/2012	31/05/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	29/06/2012	28/06/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	27/07/2012	26/07/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	24/08/2012	23/08/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	21/09/2012	20/09/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	19/10/2012	18/10/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	13/11/2012	12/11/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	12/12/2012	11/12/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	11/01/2013	10/01/2014	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	05/02/2013	04/02/2014	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-

					-	04/03/2013	03/03/2014	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	03/04/2013	02/04/2014	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	02/05/2013	01/05/2014	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	28/05/2013	27/05/2014	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	26/06/2013	25/06/2014	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	25/07/2013	24/07/2014	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	23/08/2013	22/08/2014	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	20/09/2013	19/09/2014	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	15/10/2013	14/10/2014	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	14/11/2013	13/11/2014	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-

					-	12/12/2013	11/12/2014	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	10/01/2014	09/01/2015	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	07/02/2014	06/02/2015	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	06/03/2014	05/03/2015	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	04/04/2014	03/04/2015	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	01/05/2014	30/04/2015	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	30/05/2014	29/05/2015	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	27/06/2014	26/06/2015	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	25/07/2014	24/07/2015	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	22/08/2014	21/08/2015	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-

					-	19/09/2014	18/09/2015	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	17/10/2014	16/10/2015	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	14/11/2014	13/11/2015	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	12/12/2014	11/12/2015	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	08/01/2015	07/01/2016	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	05/02/2015	04/02/2016	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	03/03/2015	02/03/2016	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	01/04/2015	31/03/2016	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	28/04/2015	27/04/2016	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	27/05/2015	26/05/2016	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-

					-	25/06/2015	24/06/2016	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	23/07/2015	22/07/2016	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	03/08/2015	02/08/2016	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	05/10/2015	04/10/2016	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	30/10/2015	29/10/2016	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	25/11/2015	24/11/2016	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	18/12/2015	17/12/2016	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
Electricity meter	EL _{LFG} EL _{PR}	PT- 0912A354- 01	ION 8600C	+/- 0.2%	27/01/2010	-	According to the Electricity Concessiona ry, there is no need of calibration after the initial one ^{/CAL/}	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-

		PT-0912A361-01	ION 8600C	+/- 0.2%	26/01/2010	-	According to the Electricity Concessionary, there is no need of calibration after the initial one ^{/CAL/}	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
Gas analyzer	to2,h fvCH4,FG,h	ULT 02 – N1X6-992	Ultramat 23	+/-1% for the CH ₄ and 0.5% for the O ₂	19/09/2011	-	18/09/2012	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	17/10/2011	16/10/2012	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	16/11/2011	15/11/2012	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	13/12/2011	12/12/2012	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	12/01/2012	11/01/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	10/02/2012	09/02/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	09/03/2012	08/03/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	06/04/2012	05/04/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-

					-	04/05/2012	03/05/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	01/06/2012	31/05/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	29/06/2012	28/06/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	27/07/2012	26/07/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	24/08/2012	23/08/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	21/09/2012	20/09/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	19/10/2012	18/10/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	13/11/2012	12/11/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	12/12/2012	11/12/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	11/01/2013	10/01/2014	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-

					-	05/02/2013	04/02/2014	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	04/03/2013	03/03/2014	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	03/04/2013	02/04/2014	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
					-	02/05/2013	01/05/2014	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
Thermocouple	T _{flare}	0950.06435	Type S	+/-1.5°C or 0.25% of the temp.	24/05/2011 <i>Replaced on 12/05/2012</i>	-	23/05/2012	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		0950.064307	Type S	+/-1.5°C or 0.25% of the temp.	-	03/04/2012 <i>Replaced on 12/03/2012</i>	02/04/2013	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-
		1121.513793	Type S	+/-1.5°C or 0.25% of the temp.	-	06/02/2013	05/02/2014	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes	-

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Document information

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